DOCUMENT RESUME

ED 129 331 IR 004 118

AUTHOR Harvey, Francis A.; And Others
TITLE Evaluation of Eight "Infinity Factory" Programs. Part II: Show-by-Show Analysis.
INSTITUTION Education Development Center, Inc., Newton, Mass.
PUB DATE Jun 76
NOTE 82p.; For a related documents see IR 004 116-119

EDRS PRICE MF-$0.83 HC-$4.67 Plus Postage.
DESCRIPTORS Attention; Comprehension; *Educational Television; Elementary Education; *Elementary School Mathematics; Grade 3; Grade 4; Grade 5; Grade 6; Humanistic Education; Knowledge Level; *Mathematics Instruction; Media Research; Mexican Americans; *Minority Group Children; Motivation; Negro Students; Program Evaluation; Self Esteem; Spanish Americans; Spanish Culture; Student Attitudes; Summative Evaluation; Teacher Attitudes
IDENTIFIERS Blacks; *Infinity Factory; Latinos

ABSTRACT

"Infinity Factory" is a television series which presents mathematics in a common-sense way to help children to understand the usefulness of mathematics in their own lives. The programs are for children ages 8 through 11, especially black and Latino children. Along with mathematics, the programs present a positive approach to the cultural and ethnic identity of minority group children. Major segments of eight programs and the series as a whole were evaluated. This report contains descriptions of each program and gives data on student attention, student appeal, teachers' opinions of the programs, and the number of kinds of related classroom activities. For each show the report presents: an abstract of its evaluation, a description of the show, a summary of evaluation procedures, and a discussion of the results of the evaluation. (JY)

****
* Documents acquired by ERIC include many informal unpublished *
* materials not available from other sources. ERIC makes every effort *
* to obtain the best copy available. Nevertheless, items of marginal *
* reproducibility are often encountered and this affects the quality *
* of the microfiche and hardcopy reproductions ERIC makes available *
* via the ERIC Document Reproduction Service (EDRS). EDRS is not *
* responsible for the quality of the original document. Reproductions *
* supplied by EDRS are the best that can be made from the original. *
****

ED129331

EVALUATION OF EIGHT "INFINITY FACTORY" PROGRAMS

PART II:

Show-by-Show Analysis

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

Francis A. Harvey, Senior Evaluator
Barbara Quiroga
Valerie Crane
Charles L. Bottoms

IR 004 118

June, 1976

edc education development center, inc./55 chapel st./newton, mass. 02160/(617)969-7100

PERMISSION TO REPRODUCE THIS COPY-
RIGHTED MATERIAL HAS BEEN GRANTED BY
Education Development
Center
TO ERIC AND ORGANIZATIONS OPERATING
UNDER AGREEMENTS WITH THE NATIONAL IN-
STITUTE OF EDUCATION. FURTHER REPRO-
DUCTION OUTSIDE THE ERIC SYSTEM RE-
QUIRES PERMISSION OF THE COPYRIGHT
OWNER.

copyright©1976 education development center, inc.

CONTENTS

Part I Analysis of the Eight-Show Series (Bound Separately)

Section I Introduction
Section 2 Method
Section 3 Analysis of the Data
Section 4 Results
Section 5 Summary and Conclusions
Section 6 Recommendations

Part II Show-by-show Analysis

Section 1 Introduction
Section 2 Method
Section 3 Analysis of the Data
Section 4 Results, Show A
Section 5 Results, Show B
Section 6 Results, Show C
Section 7 Results, Show D
Section 8 Results, Show E
Section 9 Results, Show F
Section 10 Results, Show G
Section 11 Results, Show H
Section 12 Summary and Conclusions
Section 13 Recommendations

APPENDICES (Bound Separately)

Appendix A Abstracts of Part II: Show-by-Show Analyses
Shows A to H
Appendix B Pretest/Posttest Instruments
Student Attitude Form (Pretest/Posttest)
Student Math Content Form (Pretest/Posttest)
Teacher Semantic Differential (Pretest/Posttest)
Teacher Opinion Form (Posttest Only)

CONTENTS (continued)

Appendices

Appendix C Weekly Instruments
- Student Weekly Response Forms, Shows A to H
- Student Attention Forms, Shows A to H
- Teacher Weekly Questionnaire

Appendix D Student Comprehension, Math Content, and Attitudes:
- Items Selected for Subscales

Appendix E Teacher Responses:
- Items Selected for Subscales

Appendix F Student Attention:
- Frequency Data

Appendix G Student Appeal: Comparisons Among Shows
- Frequency Data and Results of Statistical Analyses

Appendix H Student Appeal: Comparisons Among Groups
- Frequency Data and Results of Statistical Analyses

Appendix I Comprehension Subscale:
- Frequency Data

Appendix J Students' Knowledge of Math Content:
- Frequency Data

Appendix K Student Attitudes:
- Frequency Data

Appendix L Teacher Responses:
- Frequency Data and Results of Statistical Analyses

Appendix M Program Guides
- Introduction to Program Guide
- Program Guides, Shows A to H

CONTENTS (continued)

Appendices

Appendix N	Descriptive Statistics, Show-by-Show Analysis: Show A
Appendix O	Descriptive Statistics, Show-by-Show Analysis: Show B
Appendix P	Descriptive Statistics, Show-by-Show Analysis: Show C
Appendix Q	Descriptive Statistics, Show-by-Show Analysis: Show D
Appendix R	Descriptive Statistics, Show-by-Show Analysis: Show E
Appendix S	Descriptive Statistics, Show-by-Show Analysis: Show F
Appendix T	Descriptive Statistics, Show-by-Show Analysis: Show G
Appendix U	Descriptive Statistics, Show-by-Show Analysis: Show H

1. INTRODUCTION

"Infinity Factory" is a television series about mathematics, people, and people using math. The series was produced by Education Development Center, Newton, Mass., under a grant from the U.S. Office of Education, ESAA, with additional start-up support from the Carnegie Corporation of New York, John and Mary R. Markle Foundation, JDR 3rd Fund, National Science Foundation, and Alfred P. Sloan Foundation. Designed for both home and classroom viewing, the series presents mathematics in a common-sense way that helps children understand the usefulness of mathematics in their own lives. The programs are for children ages 8 through 11, especially Black and Latino children. A series of 52 half-hour programs has been produced and is scheduled for broadcast over the Public Broadcasting Service in the Fall of 1976.

"Infinity Factory" mathematics concentrates on five main areas:

1. Decimal number system, including single-digit arithmetic and techniques for getting rough arithmetic answers quickly, such as rounding off;
2. Measurement, with a special emphasis on the metric system;
3. Estimation;
4. Mapping and scaling, including treatments of ratio and proportion;
5. Graphing;

Intertwined through all the mathematical areas are some useful ways to solve problems: techniques that apply to problems in many areas. These methods are presented to encourage viewers to think creatively about problems they encounter themselves.

1.2

Along with the mathematics, "Infinity Factory" addresses a set of cultural and ethnic goals that reflect the special needs of minority children in the audience. These goals include:

1. presenting positive Black and Latino role models;
2. helping each viewer to reinforce good feelings about his or her own group, and to accept people and relationships in other groups;
3. representing the inner-city environment, both for urban audiences and for suburban and rural viewers, in order to present experiences common to many members of the target audience;
4. stressing the humanistic perspectives of sharing, cooperation, equality, and self-respect.

The program follows a magazine format. Each program centers around one main math theme, usually involving two or three skills or concepts. Several short segments in each program treat this mathematical theme from different perspectives, developing the mathematics in several related ways. These segments show math at work in people's everyday lives.

The major segments of each program are:

"Scoops' Place" -- a live-action, dramatic segment about a Black family who runs a neighborhood store in New York City.

"City Flats" -- also live-action, is about a Latino family operating a bakery in East Los Angeles.

"Brownstone" segments -- a resident multi-ethnic cast of young people act in short skits that usually take place in and around an urban "Brownstone" apartment house built in a television studio.

Animation segments -- used to present certain math concepts in a humorous and direct manner.

In addition, every program features a historical segment introduced by the "Brownstone" cast. Each of these segments points out an important contribution made by a notable minority person, often in a field involving mathematics. Some programs also include "Math in the Street" interviews, which present spontaneous responses from many people to a question about mathematics.

In conjunction with the trial broadcast season of the "Infinity Factory" series during the Spring of 1976, an evaluation of eight programs was conducted.* The evaluation effort spanned a ten-week period: one week of pretesting, eight weeks of in-school viewing, and a final week of posttesting. The program was viewed in four cities in the United States. Over 1,000 students and their teachers in 39 third-to-sixth-grade classes participated in the study.

The objectives of the evaluation were:

1. to determine student attention to the programs;
2. to determine the appeal of the overall programs and of the major segments of each program to both students and teachers;
3. to determine student comprehension of the dramatic story lines;
4. to determine the degree to which the eight-program "mini-series" met its objectives in the areas of learning math content, attitudes toward math, and social attitudes;

---

* The eight programs evaluated were:

Program	Broadcast Number	Topic
A	114	Measurement of Time
B	127	Rounding Off and Approximation
C	130	Measurement of Weight
D	131	Mapping and Scaling
E	103	Graphing
F	123	Estimation of Quantity
G	129	Measurement of Weight
H	132	Mapping and Scaling

5. to determine teachers' opinions of the effectiveness of the series and its usefulness in the classroom.

This evaluation report will include two parts, Part I examines the effectiveness of the eight programs taken as a whole through statistical analyses of pretest/posttest differences, subscales based on responses over eight programs, and trends over eight programs. In particular, Part I focusses on student attention, student appeal, students' comprehension of dramatic story lines, students' knowledge of math content, students' attitudes, and teachers' attitudes.

Part II of the report presents a descriptive report on each of the eight programs in the areas of student attention, student appeal, teachers' opinions of the programs, and the number and kinds of related classroom activities. For each show this part of the report will include:

1. An abstract which will provide an overview of the evaluation of each show and highlight the major findings;
2. A description of the show, its main math ideas, and highlights;
3. A summary of the procedures for each week, including the number of students and teachers who responded, and any specific problems encountered;
4. A summary and discussion of the results for student attention, student appeal, teachers' reactions, and the number and kind of related activities which took place.

2. METHOD

Subjects

Students and teachers in 39 classes participated in the evaluation study. There were 5 classes (n = 131 students) in Lawrence, Massachusetts;* 13 classes (n = 265) in Boston, Massachusetts; 10 classes (n = 319) in Los Angeles, California; and 11 classes (n = 327) in New York, New York. There were 2 third grade classes, 15 fourth grade classes, 12 fifth grade classes, and 10 sixth grade classes. The study included a total of 562 girls and 480 boys; Table 2.1 provides a further breakdown according to ethnic group, age, and sex for all students for whom complete data were available. (Since the primary focus of this evaluation was on the effectiveness of the "Infinity Factory" programs for Black and Latino students, students who were white or other minority were pooled into the category of non-target students.)

The sample of 39 teachers was comprised of 8 Black women, 2 Latino women, 23 white women, and 4 white men. The teachers had an average of 7.6 years of teaching experience. Of the 39 teachers, 14 described themselves as infrequent users of media (television and other audio-visual materials); 11 teachers described themselves as moderate users of media; and 14 teachers described themselves as frequent users of media.

---

* A small, industrial city north of Boston.

Table 2.1

Description of Sample Population

Group	Age		Total
	Younger Students[a]	Older Students[b]	
Black Students			
Boys	122	69	191
Girls	140	93	233
Latino Students			
Boys	63	90	153
Girls	82	97	179
Non-Target Students			
Boys	62	53	115
Girls	59	70	129
Total	528	472	1000

Note. $n_{boys} = 459$.
$n_{girls} = 541$.

[a]Ten years old or younger.

[b]Eleven years old or older.

Experimenters

In each city, visitors were drawn from local universities or school systems and were identified by contacts based on their qualifications and experience working with children. Whenever possible, visitors were placed in classrooms so that the visitor was from the same ethnic group as the majority of students in that class.

However, this was possible in only a few cases because most of the classes participating in the study were integrated classes.

In each city, testers were trained to administer the pre- and posttests. Two of the testers were evaluation project staff members; the other eight testers were graduate students drawn from local universities in each city.

Instruments

Two types of instruments were developed for this study: instruments which were used as pretest/posttest measures, and instruments which were used weekly. Some instruments were completed by the students, some by the teacher, and some by the visitor. Those instruments which were completed by the visitor provided information on students' responses to the programs as well as on the amount and kinds of related classroom activities which took place each week. Only those instruments which were used weekly will be described in this part of the report.

All instruments which were employed in the evaluation were pilot-tested with small groups of target audience students.

Each week, both students and teachers recorded their reactions to the "Infinity Factory" program immediately after viewing. Visitors monitored students' attention during the program viewing; visitors also observed and recorded the behaviors of students and teachers before and after program viewing, and collected other information about related activities which occurred during the week.

Student Weekly Response Form. Each week, immediately following viewing of "Infinity Factory," students completed a Student Weekly Response Form (see Appendix C.) The first side of this instrument measured student appeal for the show overall, the "Brownstone" segments, "City Flats," "Scoops' Place," and animation. The visitor and students read through the entire instrument together and students checked boxes if they thought a specific segment was hard or easy, good or no good, fun or no fun, too long or too short, and too fast or too slow. It was determined in questioning students after post-testing that the items "too long or too short," and "too fast or too slow" were misunderstood by about half of the sample, and therefore these items were dropped from the analysis.

The second side of the Student Weekly Response Form measured students' comprehension of story line, knowledge of math content, attitudes toward math, and social attitudes. Ten statements which sampled the objectives of the program in the above areas were used each week. The visitor and students read through the ten statements together. If a student agreed with a statement, he or she circled yes; if a student disagreed with a statement, he or she circled no. In addition, two free response items were included for those programs for which this format was appropriate. Responses on the second side of the Student Response Form were aggregated into Comprehension, Math Content, and Attitude Subscales and analyzed in Part I of this report. Students were able to complete the Student Weekly Response Form in approximately 15 minutes.

Student Attention Form. Visitors were trained to observe and record viewing behavior of students while they watched the television program, using the Student Attention Form (see Appendix C). The visitor observed two groups of five students each, alternating between groups every 15 seconds. The visitor recorded the number of students in each group who were either attending to or actively responding to the program during that 15-second interval. Attending was operationally defined as maintaining eye contact with the television screen; responding was defined as being actively involved with the program, e.g., commenting on the program, laughing, or moving to the music. Audio cues on the Student Attention Form indicated the end of each 15-second segment.

Teacher Weekly Questionnaire. Each week the teacher completed a Teacher Weekly Questionnaire (see Appendix C). This instrument was the same for each week and contained 39 statements which teachers checked if they agreed with the statement. Statements dealt with 11 areas related to the program:

1. educational effectiveness;
2. class preparation;
3. program guides;
4. program presentation;
5. use of language;
6. technical quality;
7. student attention;
8. program appeal;
9. math content;
10. math attitudes; and
11. social attitudes.

In addition, teachers were encouraged to write any comments they might have on specific aspects of the program and/or

changes they would suggest. Teachers were also asked to report any follow-up activities which took place during the week, and to describe any students' reactions to previous weeks' programs.

Training Procedures

Visitors attended a one-day training session where the objectives of the evaluation study, procedures to be followed, and instruments to be used were explained. Detailed, written instructions for using each instrument were provided, including protocols for instructing students in the use of the Student Weekly Response Forms and for any additional verbal information to be provided students. Videotapes of groups of children watching a television program were used to train visitors in the use of the Student Attention Form and to maximize interrater reliability among visitors.

Teachers attended a half-day orientation session where the objectives and scope of the "Infinity Factory" series and the procedures of the evaluation study were explained. Teachers were provided copies of Program Guides for the eight programs, and were told to use the programs as they saw fit with their students.

Testers were provided with specific instructions on procedures to be followed during the pre- and post-testing sessions.

Experimental Procedures

The programs were broadcast over WGBH-TV for Boston and Lawrence classes, and over KCET-TV for Los Angeles classes. Classes in New York viewed the program using in-school videotape equipment.

Experimental Sessions. For each of the eight weekly viewing sessions, the classroom visitor arrived in the classroom about 15 minutes before the program was scheduled to begin. The visitor recorded any related classroom activities which occurred before the program.

The class viewed the half-hour television program either in their classroom or in another room in the school. During the viewing session, the visitor recorded eye contact and active responses for two groups of five students each, alternating from one group to another at 15-second intervals, using the Student Attention Form.

Immediately following program viewing, the visitor and students completed the Student Weekly Response Form. The visitor and students read through all items together as the students filled out this form. At the same time, the teacher completed a Teacher Weekly Questionnaire.

Afterwards, the visitor observed and recorded any follow-up classroom activities. Before leaving the classroom, the visitor reminded the teacher to note any related activities during the coming week, and any incidental references to the program made by students.

Visitors monitored what happened in the classroom before, during, and after program viewing. They reported and categorized any related activities which occurred before or after the program, noting whether the teacher dealt with the math content, cultural, or other attitudinal areas of the program and whether the teacher used any suggestions from the Program Guides.

3. ANALYSIS OF THE DATA

Student Attention

An attention score was calculated from the mean percentage of children attending to and/or actively responding to each 15-second segment. From this score the mean percentage of attention was calculated for each show overall and for each major segment.

A graph of the mean percentage of children responding, and of the mean percentage of children both attending and responding, was constructed for each show. Those parts of the show where attention was relatively high or relatively low, and apparent trends in attention within each show, were noted.

Student Appeal

Student appeal was determined from responses to the first side of the Student Weekly Response Form (see Appendix C). Students rated five areas of each show (the show overall, "Brownstone" segments, "City Flats," "Scoops' Place," and animation segments) hard or easy, good or no good, and fun or no fun. Responses on the adjective pairs were aggregated into subscales for the show overall and for the four major segments, based on the number of positive adjectives checked (range 0 to 3).

These subscales were informally analyzed in cross-breakdowns according to age (younger students, aged 8-10; and older students, aged 11 through 13); ethnic group (Black, Latino, and non-target students); and sex. Differences larger than .10 on the 3-point subscales were noted.*

*The value .10 was selected as a criterion because it is approximately twice the standard error of the difference between means for any two sample subgroups.

Teacher Response

Teachers' attitudes toward the eight "Infinity Factory" programs were determined from teachers' responses to the 39 items on the Teacher Weekly Questionnaire (see Appendix C). Ten subscales were constructed from 37 items:

1. Class Preparation;
2. Program Guides;
3. Program Presentation;
4. Use of Language;
5. Technical Quality;
6. Student Attention;
7. Student Appeal;
8. Math Content;
9. Math Attitudes;
10. Social Attitudes.

The items which made up each subscale are listed in Appendix E. Item 37 ("This program was educationally effective") and Item 38 ("The overall presentation in this week's program was (check one) outstanding (=4)/good (=3)/ mediocre (=2)/poor (=1)") were analyzed separately.

Related Activities

The number and kind of related classroom activities which took place before and/or after the program were tabulated. The type of activity, whether the teacher used ideas from the Program Guides; and whether the teacher dealt with the math content, cultural aspects, or other attitudinal areas of the show were noted for each activity.

ABSTRACT

Show A: Evaluation Report

The math topic for Show A is measurement of time. Data were collected from 840 students in 39 classes, and from 37 of the 39 teachers.

The mean percentage of attention for the show overall was quite high (93%). Attention dropped off considerably only during the second "Math in the Street" segment.

All mean student appeal ratings were above 2.25 on a 3-point scale. The show overall was rated higher than separate segments; "Scoops' Place" was rated lowest. Black students rated the show overall higher than non-target students, but they rated "Scoops' Place" lower than either Latino or non-target students. Girls rated "Brownstone" segments and "City Flats" higher than boys. No age differences were noted.

Most teachers (76%) considered the show educationally effective; 89% rated the overall presentation good or outstanding. Teachers' ratings were highest on the Student Attention(93%), Language(87%), and Math Attitudes (84%) Subscales; and lowest on the Social Attitudes(73%), Program Guides(70%), and Math Content(62%) Subscales. Areas which teachers specified as needing improvement were: voices(38%), math content(32%), and language(24%).

Twenty classes engaged in related activities before and/or after the show. Most of these (76%) were discussions and most (80%) dealt with the math content of the show.

4. SHOW A

Introduction

The math topic for Show A is measurement of time. This show introduces minutes and seconds as units of time, and demonstrates the need for standard units of time, without discouraging use of non-standard units of time when appropriate. Some highlights of the show are:

-- In "Scoops' Place," Pretty Boy realizes the importance of being able to read a clock when he is dropped from Kung Fu class for being late too often.
-- In "City Flats," Loli, Apple, and Tito have to measure time when baking a cake for their parents' anniversary.
-- A computer-animated segment uses the face of a clock to show the importance of the minute hand.

The Program Guide for Show A can be found in Appendix M.

Student Response Forms were completed by 840 students in 39 classes. Student attention data were collected from 37 classes, and 37 teachers completed weekly questionnaires. Six visitors reported poor audio or video reception.

Results and Discussion

Attention. Figure 4.1 is a graph of the mean percentage of students attending to and actively responding to each 15-second segment of Show A. The mean percentage of attention for the show overall and for the major segments of the show is presented in Appendix N, Table N.1.

4.2

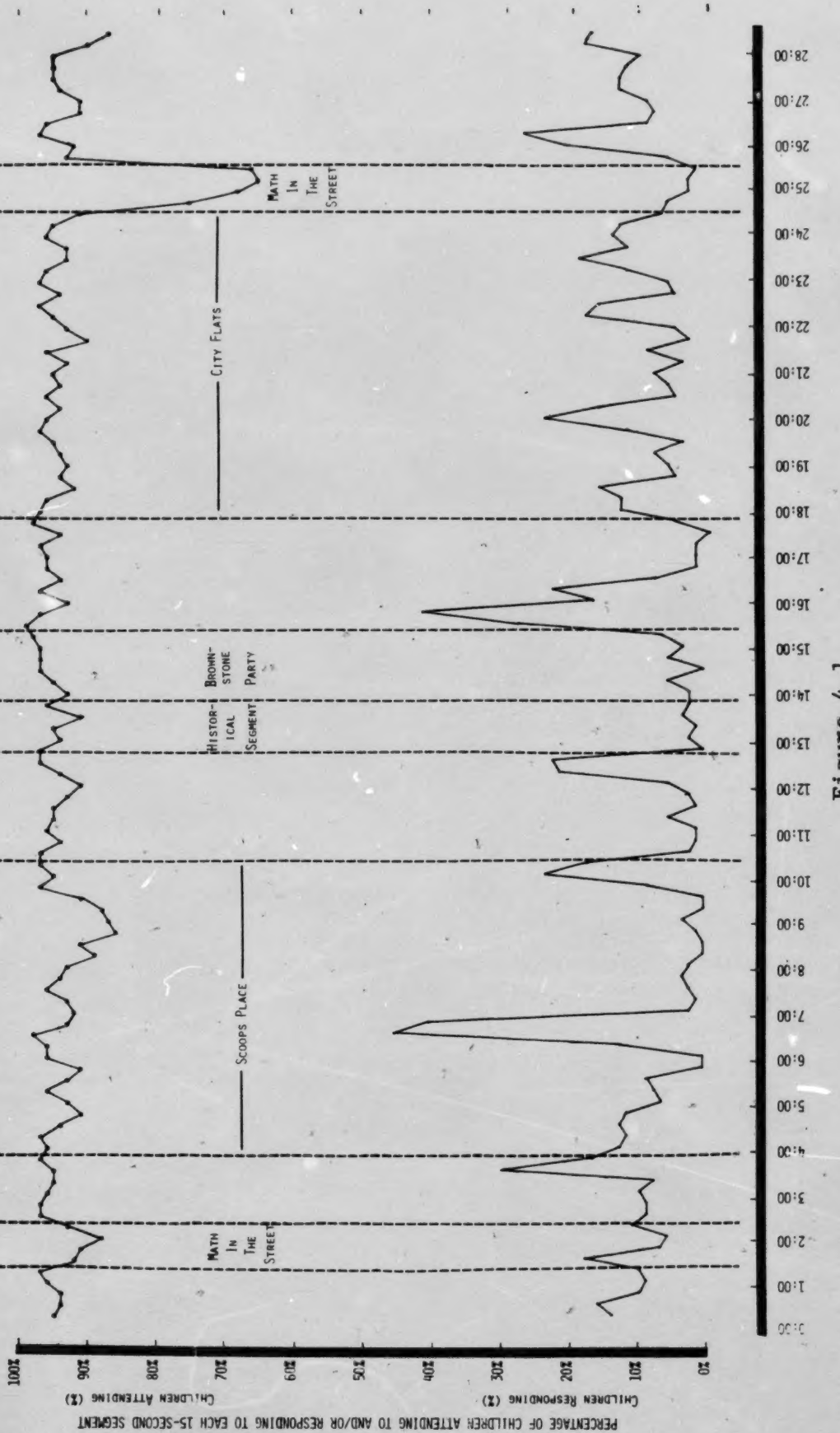
SHOW A N = 37 CLASSES
PERCENTAGE OF CHILDREN ATTENDING TO AND/OR RESPONDING TO EACH 15-SECOND SEGMENT
CHILDREN RESPONDING (%)
CHILDREN ATTENDING (%)
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
0:00
1:00
2:00
3:00
4:00
5:00
6:00
7:00
8:00
9:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
24:00
25:00
26:00
27:00
28:00
MATH IN THE STREET
SCOOPS PLACE
HISTORICAL SEGMENT
BROWNSTONE PARTY
CITY FLATS
MATH IN THE STREET

Figure 4.1

Attention was quite high overall (mean = 93%), and dropped off considerably at only one point in the show: during the second "Math in the Street" segment (mean = 69%).

Appeal. Students' ratings of appeal for the show overall and major segments of Show A are shown in Appendix N, Tables N.2 to N.5. The data are summarized below in Table 4.1.

Table 4.1

Mean Student Appeal Ratings: Show A

Group	Show Overall	Segment[a]		
		Brownstone Segments	City Flats	Scoops' Place
Ethnic Group				
Black Students	2.88	2.79	2.71	2.25
Latino Students	2.83	2.74	2.71	2.44
Non-Target Students	2.78	2.71	2.68	2.48
Age				
Younger Students	2.84	2.76	2.71	2.34
Older Students	2.83	2.75	2.70	2.42
Sex				
Boys	2.79	2.70	2.65	2.41
Girls	2.87	2.80	2.74	2.35
Total	2.84	2.75	2.70	2.38

Note. Differences larger than .10 on the 3-point scale were considered substantial differences.

[a] Show A had no cartoon animation segments.

Of particular interest in student appeal ratings for Show A are the following:

1. The ratings were generally high; no segment was rated below 2.25 on a 3-point scale. The high ratings may be partly due to the newness of the show and the excitement of participating in a special project.
2. For all student subgroups, the mean appeal rating for "Scoops' Place" (2.38) was substantially lower than other appeal ratings. Although Black students had rated the show overall substantially higher than non-target students, they rated "Scoops' Place" (mean = 2.25) substantially lower than either Latino (2.44) or non-target students (2.48). A number of Black students (n = 55) did not respond to this item.
3. There was no substantial difference between older and younger students, and between girls and boys.

Teacher Responses. A summary of teachers' responses on the Teacher Weekly Questionnaire is presented in Appendix N, Table N.6.

Teachers in general responded quite positively to the program. A substantial majority (76%) considered the program to be educationally effective and suitable for target audience children. Four teachers (11%) rated the overall presentation outstanding, 29 (78%) rated it good, two (5%) rated it mediocre, and two (5%) did not rate the program.

Teachers gave Show A high ratings on Student Attention (93%), Language (87%), Math Attitudes (84%), and Program Appeal (82%) Subscales. Mean ratings for Show A were lower on Program Presentation (77%), Technical Reception (74%), Social Attitudes (73%), and Program Guides (70%) Subscales. Show A received the lowest Math Content Subscale mean rating of any show (62%).

Of the 12 suggested program areas listed for improvement, only three were checked by more than 20% of the teachers. Thirty-eight percent reported that voices needed improvement, 32% reported that math content need improvement, and 24% reported that language needed improvement.

Twenty-seven teachers (73%) offered additional comments about the program. These comments included:

-- math topic too easy (6 teachers);
-- more math content or more information (4);
-- poor diction or unclear speech (10).

Of particular interest in teachers responses to Show A are the following:

1. The math content for Show A was rated relatively low. Two factors may contribute to this. First, the program is designed for use both at home and in schools; in order to compete successfully for the home viewing audience the density of the math content was deliberately kept at a lower level than would be found in traditional instructional programs designed primarily for school use. Second, the content of this program was more appropriate for the younger students in the target audience.
2. Several different issues seem to be involved in teachers' responses concerning the use of language in the program. One issue concerns

the technical quality of the audio signal and the diction of some cast members, both of which were problems which had been recognnized by the project staff and improved in later programs. A second issue concerns the use of non-standard English. This issue was recognized from testing of the pilot programs and from previous testing to be a potential source of problems. Teachers feel they have a responsibility to encourage their students to use correct grammar and standard English, and with discouraging the use of slang, street language, and other forms of non-standard English. However, in order to have the situations portrayed on the "Infinity Factory" programs appear realistic, some use of non-standard English is necessary, and a conscious production decision was made to use the type of language which is used in the program for that reason. The final version of the Introduction to Program Guide will include a section explaining the use of language in the programs.

Related Activities. Sixteen classroom teachers (42%) conducted a related classroom activity and/or discussion before viewing Show A (see Appendix N, Table N.7. In those 16 classrooms, there were 12 discussions, 2 activities, and 2 planned lessons. Nine teachers used suggestions from the Program Guide.

Twelve teachers (32%) conducted a related classroom activity and/or discussion immediately after Show A. Activities took place in five classrooms.

Nine teachers (24%) reported that their classes worked on related activities during the week after watching Show A. Eight teachers (22%) reported that students discussed various aspects of the program or used specific concepts from Show A.

Of the 20 teachers (53%) who conducted a related activity and/or discussion before, after, or both before and after their classes viewed Show A: 16 dealt with the math content of the program, one teacher dealt with the cultural aspects of the program, and six dealt with the other attitudinal aspects of the program.

Of particular note is the finding that at this point teachers are making more use of the math content of the program than of its social or cultural aspects, although seven teachers (approximately a third of those who conducted related activities) did deal with non-math aspects of the program.

ABSTRACT

Show B: Evaluation Report

The math topics for Show B are rounding off and approximation. Data were collected from 801 students in 39 classes, and from 37 of the 39 teachers.

The overall mean percentage of attention for Show B was 93%. Attention declined only during the historical segment.

All student mean appeal ratings were above 2.53 on a 3-point scale. Students rated the show overall higher than any of the four segments in Show B. There were no differences among ethnic groups in the appeal of "City Flats." Black students rated all other segments higher than Latino and non-target students. Girls rated the show overall, "Brownstone" segments, and "Scoops' Place" higher than boys. There were no other differences between boys and girls, or between age groups.

Most teachers (84%) considered the show educationally effective; 92% rated the overall presentation good or outstanding. Teachers' ratings were highest on the Student Attention (92%), Math Attitudes (87%), Math Content (85%), Language (85%), and Program Appeal (84%) Subscales; and lowest on the Technical Reception (76%), Social Attitudes (75%), and Program Guides (71%) Subscales. Areas which teachers specified as needing improvement were: voices (35%), more visuals (27%), math content (27%), and Program Guide (24%).

Twenty-one classes engaged in related activities before and/or after the show. Most of these were discussions; most of these (86%) dealt with the math content, although a considerable number (43%) dealt with cultural or social areas of the show.

5. Show B

Introduction

The math topics for Show B are approximation and rounding off. Show B demonstrates how to round off numbers, the advantages of rounding off, and the application of rounding off when adding. Some highlights of the show are:

-- The "Brownstone" cast sings about rounding off;
-- A film documentary presents a newspaper boy who rounds off to figure out how much money he needs for a new bicycle;
-- In "City Flats," Apple rounds off to find out how much money the children need to open a raspadas stand;
-- In "Scoops' Place," the children try to discover Scoops' "secret method" for adding numbers quickly -- rounding off.

The Program Guide for Show B can be found in Appendix M.

Student Response Forms were completed by 801 students in 39 classes. Student attention data were collected from 38 classes, and 37 teachers completed weekly questionnaires. Only one visitor reported poor video reception.

Results and Discussion

Attention. Figure 5.1 is a graph of the mean percentage of students attending to and actively responding to each 15-second segment of Show B. The mean percentage of attention for the show overall and for the major segments of the show is summarized in Appendix O, Table O.1.

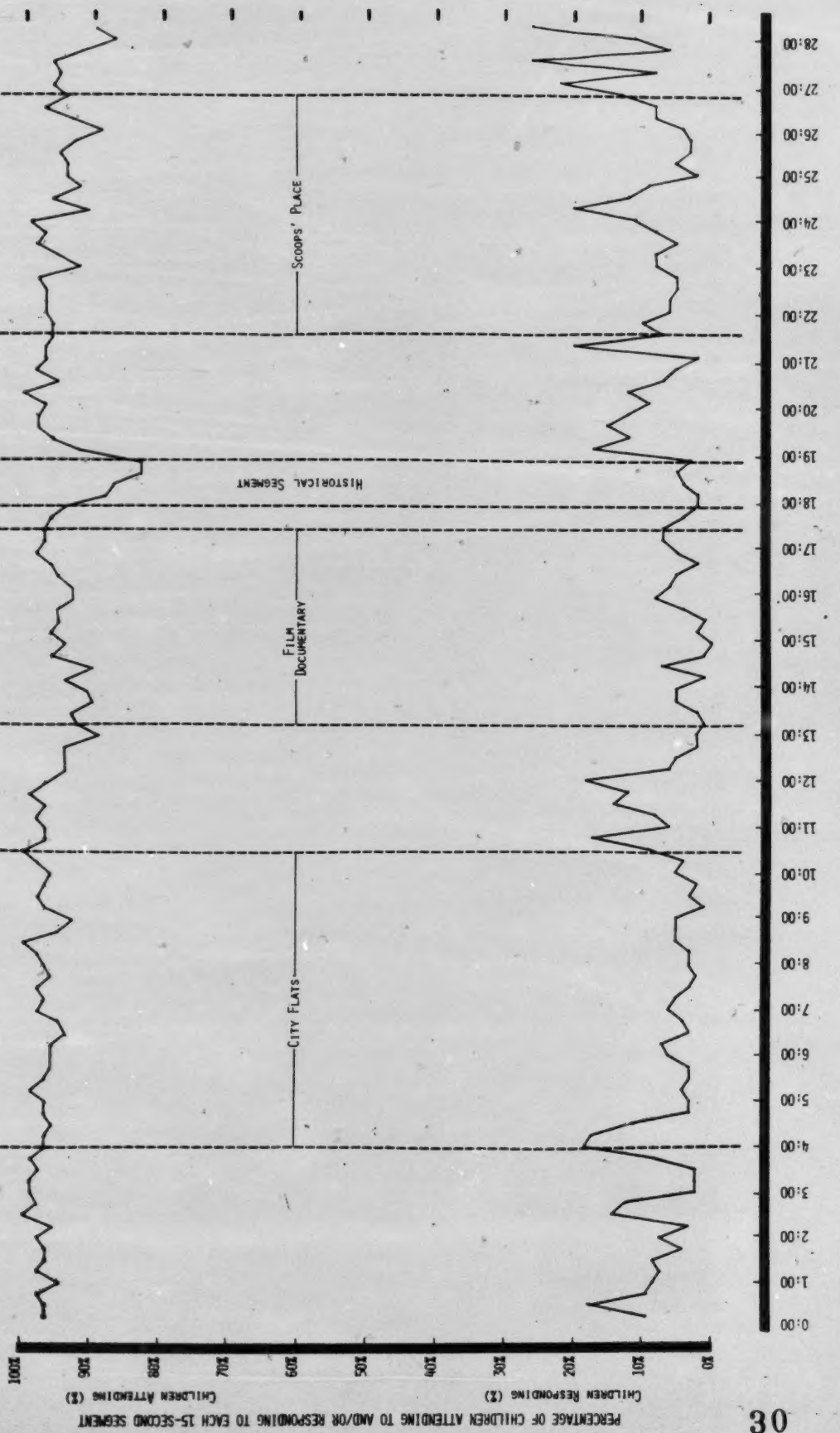
SHOW B N = 38 CLASSES
PERCENTAGE OF CHILDREN ATTENDING TO AND/OR RESPONDING TO EACH 15-SECOND SEGMENT
(CHILDREN RESPONDING (%))
(CHILDREN ATTENDING (%))
SCOOPS' PLACE
HISTORICAL SEGMENT
FILM DOCUMENTARY
CITY FLATS

Figure 5.1

Student attention was very high throughout Show B (mean = 95%). Attention declined slightly during the historical segment (mean = 86%).

Appeal. Students' ratings of appeal for show overall and major segments of Show B are shown in Appendix O, Tables O.2 to O.6. The data are summarized below in Table 5.1.

Table 5.1

Mean Student Appeal Ratings: Show B

Group	Show Overall	Segment			
		Brownstone Segments	City Flats	Scoops' Place	Animation Segments
Ethnic Group					
Black Students	2.88	2.82	2.69	2.71	2.83
Latino Students	2.77	2.65	2.63	2.61	2.69
Non-Target Students	2.72	2.60	2.66	2.59	2.68
Age					
Younger Students	2.83	2.72	2.66	2.62	2.77
Older Students	2.78	2.70	2.65	2.67	2.73
Sex					
Boys	2.74	2.65	2.64	2.58	2.76
Girls	2.87	2.77	2.67	2.70	2.74
Total	2.81	2.71	2.66	2.64	2.75

Note. Differences larger than .10 on the 3-point scale were considered substantial differences.

Of particular interest are the following results:

1. All student groups rated Show B overall substantially higher than separate segments of the show, and they rated all four segments the same.
2. Black students' ratings were substantially higher than Latino and non-target students' for all areas but "City Flats".
3. Girls' ratings were higher than boys' for three of the five areas rated.
4. There were no substantial differences between younger and older students on any appeal subscale.

Teacher Responses. A summary of teachers' responses on the Teacher Weekly Questionnaire is presented in Appendix O, Table O.7.

Thirty-one teachers (84%) rated Show B educationally effective. Seven teachers (19%) rated the overall presentation of Show B outstanding, 27 (73%) rated it good, one (3%) rated it mediocre, one rated it poor, and one did not rate the program.

Teachers rated Show B higher on the Student Attention Subscale (92%) than on any other subscale. Ratings on the Math Attitude (87%), Math Content (85%), Language (85%), and Program Appeal (84%) Subscales were also high. Much of the relatively high Math Content subscale scores can be attributed to extremely high ratings on two items on that subscale related to whether the math topic was appropriate for students and for the math curriculum. Ratings of Program Presentation, Technical Reception, Social Attitudes and Program Guides Subscales (means = 78%, 76%, 75%, and 71%, respectively) were lower.

Only 4 of the 12 suggested program areas listed for improvement were checked by more than 15% of the teachers: voices (35%), more visuals (27%), math content (27%), and Program Guide (24%).

Thirty teachers (81%) offered additional comments about the program. These comments included:

-- problems understanding language or voices (7 teachers);
-- animation segments very good (5);
-- more development of math ideas (4);
-- music good; maintained student attention (3).

Teachers' responses in three areas are of particular note:

1. Teachers rated Show B comparably on the Math Content and Math Attitude Subscales, indicating that they considered the program effective both for motivating and teaching math.
2. Responses on the Language Subscale and teachers' additional comments indicate that there is more of a problem with the audio signal and the diction of some cast members in Show B than with the use of non-standard English.
3. The low Program Guide Subscale rating and the substantial number of teachers who checked Program Guides as an area needing improvement indicate some dissatisfaction with the Program Guides.

Related Activities. Related activities took place in a little more than half of the classrooms involved in the study (see Appendix O, Table O.8).

Fifteen classroom teachers (40%) conducted a related classroom activity and/or discussion before viewing Show B. There was a discussion in each of the 15 classrooms and there were three classrooms where activities took place. Ten teachers used suggestions from the Program Guide.

Sixteen teachers (42%) conducted a related classroom activity and/or discussion after Show B. In those 16 classrooms, there were 14 discussions and 4 activities.

Fifteen teachers (30%) reported that their classes engaged in a math content-related activity during the week following the program.

Teachers made most use of the math aspects of Show B, although a substantial number of those who conducted related activities dealt with cultural and other attitudinal areas as well. Of the 21 teachers (55%) who conducted a related activity and/or discussion before, after, or both before and after their classes viewed Show B: 18 dealt with the math content of the program, 4 dealt with the cultural aspects of the program, and 5 dealt with other attitudinal aspects of the program.

Of particular interest is the finding that about half of the teachers are conducting related activities, and most of these deal only with math content.

ABSTRACT

Show C: Evaluation Report

The math topic for Show C is measurement of weight. Data were collected from 820 students in 38 classes, and from 38 teachers. Twelve classes (31% of the sample) reported audio or video problems.

Overall attention for Show C was quite high (89%), but lower than for previous shows. Some of the decline in attention could be attributed to the 12 classes (31%) who reported audio or video reception problems. Attention declined during the film documentary and the second "Math in the Street" segment.

Student appeal ratings were quite high (all were above 2.47 on a 3-point scale). Students rated "City Flats" substantially lower than "Scoops' Place" or animation. Black students' mean appeal ratings were higher than non-target students' for all areas except animation, where there was no difference.

Fewer teachers (63%) rated Show C educationally effective; 64% rated the overall presentation good or outstanding. Show C was rated lower than all other shows on all subscales except the Math Content Subscale and Student Attention Subscales, and was rated lower than most shows on those two subscales. Program Guides and Social Attitudes were rated relatively lower than other areas. Areas which teachers specified as needing improvement were: voices (34%), math content (32%), language (29%), and more visuals (24%).

Seventeen classes engaged in related activities before and/or after the show. Nearly all of these were discussions, and nearly all dealt exclusively with the math content.

6. SHOW C

Introduction

The math topic for Show C is measurement of weight. Show C introduces the kilogram as a unit of weight and demonstrates measuring weight with a scale. The importance of measuring weight is stressed. Some highlights are:

-- In an animation segment, a little girl weighs her trunk at the airport.
-- In "Scoops' Place," Allieboy shows off his strength by lifting weights.
-- A film documentary presents the Los Angeles Produce Market.
-- In an animation segment, contenstants on a game show guess which object weighs closest to one kilogram.
-- In "City Flats," Apple and Loli, using a scale in different ways, come up with the same weight.

The Program Guide for Show C can be found in Appendix M.

Student Response Forms were completed by 820 students in 38 classes. Student attention data were collected from 37 classes, and 38 teachers completed the Teacher Weekly Questionnaire. One class did not view the program because of a field trip. Twelve visitors (representing 31% of the total sample) reported serious audio or video problems.

Results and Discussion

Attention. Figure 6.1 is a graph of the mean percentage of students attending to and actively responding to

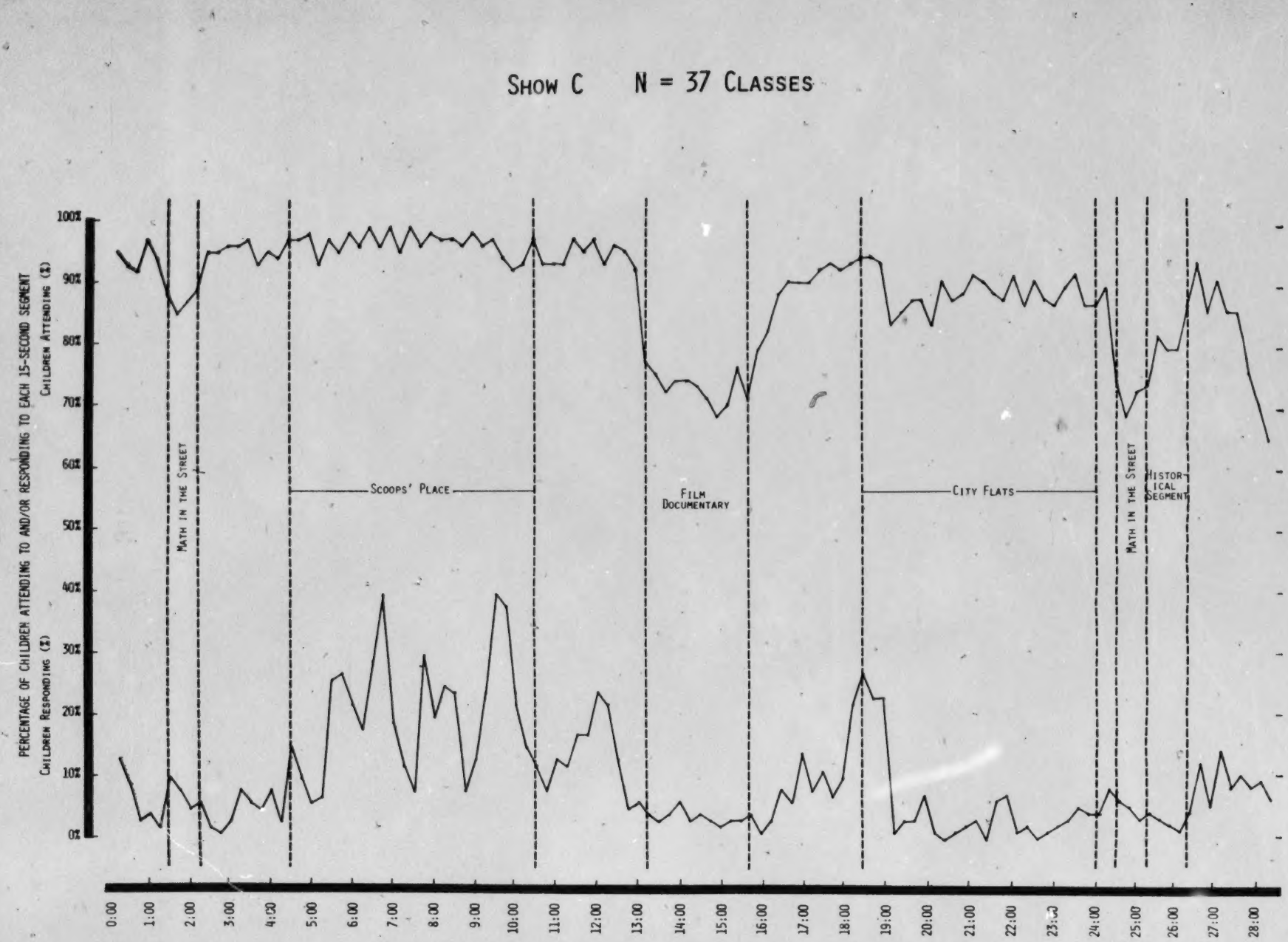
SHOW C N = 37 CLASSES
PERCENTAGE OF CHILDREN ATTENDING TO AND/OR RESPONDING TO EACH 15-SECOND SEGMENT
CHILDREN ATTENDING (%)
CHILDREN RESPONDING (%)
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
MATH IN THE STREET
SCOOPS' PLACE
FILM DOCUMENTARY
CITY FLATS
MATH IN THE STREET
HISTORICAL SEGMENT
0:00
1:00
2:00
3:00
4:00
5:00
6:00
7:00
8:00
9:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
24:00
25:00
26:00
27:00
28:00

Figure 6.1

each 15-second segment of Show C. The mean percentage of attention for the show overall and for the major segments of the show is summarized in Appendix P, Table P.1.

The overall mean percentage of attention for Show C was quite high (mean = 89%), although lower than for the two previous shows. Much of this drop in attention can be attributed to the lower attention reported by the twelve classes which had video or audio problems with Show C. Attention during the "Scoops' Place" segment (mean = 96%) was relatively higher than for the show overall. Attention declined during the film documentary (mean = 73%) and during the second "Math in the Street" segment (mean = 72%).

Appeal. Students rated the appeal of all areas of Show C highly; all mean ratings were above 2.47 on a 3-point scale. Students' ratings of overall appeal and major segments of Show C are shown in Appendix P, Tables P.2 to P.6. These data are summarized below in Table 6.1

Of particular interest in the appeal data for Show C are the findings that:

1. students' mean appeal ratings were quite high, in spite of the reception problems reported by 31% of the classes;
2. the mean appeal rating for "City Flats" (2.59) was substantially lower than for "Scoops' Place" (2.71) or animation segments (2.70);
3. Black students' mean appeal ratings were substantially higher than non-target students' for all areas rated except the animation segments, where there was no difference.

Table 6.1

Mean Student Appeal Ratings: Show C

Group	Show Overall	Segment			
		Brownstone Segments	City Flats	Scoops' Place	Animation Segments
Ethnic Group					
Black Students	2.70	2.72	2.62	2.76	2.73
Latino Students	2.65	2.67	2.64	2.68	2.68
Non-Target Students	2.57	2.54	2.47	2.66	2.66
Age					
Younger Students	2.65	2.65	2.58	2.72	2.65
Older Students	2.65	2.67	2.60	2.69	2.75
Sex					
Boys	2.66	2.61	2.59	2.63	2.66
Girls	2.64	2.70	2.58	2.70	2.72
Total	2.65	2.66	2.59	2.71	2.70

Note. Differences larger than .10 on the 3-point scale were considered substantial differences.

Teacher Responses. Appendix P, Table P.7 presents teachers' responses on the Teacher Weekly Questionnaire for Show C.

Teachers' responses to Show C were less positive than their responses to the previous shows. Twenty-four teachers (63%) rated Show C educationally effective. Seven teachers (18%) rated the overall presentation of Show C outstanding, 18 (48%) rated it good, 7 (18%) rated it mediocre, 3 (8%) rated it poor, and 3 (8%) did not rate the program.

Scores on all ten subscales declined markedly compared to previous weeks' responses. Teachers rated Show C highest on the Student Attention (75%), Math Attitudes (74%), and Language (72%) Subscales. Presentation (67%), Math Content (66%), and Program Appeal (64%) Subscales were rated lower, and the lowest ratings were given the Technical Reception (59%), Social Attitudes (58%), and Program Guides (57%) Subscales.

Four of the 12 suggested program areas listed for improvement were checked by more than 19% of the teachers: language (29%), voices (34%), math content (32%), and more visuals (24%).

Twenty-eight teachers (74%) offered additional comments about Show C. These included:

-- poor diction of some cast members (7 teachers);
-- more math content development (5);
-- level of math facts too low (3);
-- more explanation of metric system (3).

Several aspects of teachers' responses to Show C are of interest:

1. Show C was rated lower than any other show on all subscales but the Student Attention and Math Content Subscales, and was rated lower than most other shows on these subscales;
2. Twelve classes (31%) reported serious audio or video problems for Show C, and the poor reception in these classes may have contributed to teachers' overall low opinion of Show C;
3. Teachers continued to give relatively lower ratings on the Program Guides and Social Attitudes Subscales;
4. Cast diction and audio reception continued to be problems for 30% of the teachers.

Related Activities. Thirteen classroom teachers (36%) participated in a related classroom activity and/or discussion before viewing Show C (see Appendix P, Table P.8). There were 13 discussions, three of which were planned lessons, and two of which involved activities. In seven classes, teachers used suggestions from the Program Guide to prepare their students.

Eleven classes (31%) participated in a related activity or discussion immediately after the program. In the 11 classes there were 10 discussions, 5 planned lessons, and 3 activities.

Nine teachers (24%) reported that their class engaged in some math content-related activity during the week following the program.

Of the 17 teachers (47%) who conducted a related activity and/or discussion before or after the program, 16 dealt with the math content of the program, none dealt with the other attitudinal areas of the program.

Of particular note concerning related activities are the following:

1. The number of activities related to Show C which took place is not markedly different from previous weeks, even though teachers' general ratings for Show C were considerably lower than for the previous two shows;
2. An overwhelming majority of those teachers who did conduct related activities dealt with the math content, while less than 10% dealt with cultural or attitudinal aspects of the program.

ABSTRACT

Show D: Evaluation Report

The math topic for Show D is mapping and scaling. Data were collected from 834 students in 39 classes, and from 37 of the 39 teachers.

The mean percentage of attention for Show D was 91%. Attention declined during "Scoops' Place" and during the historical segment.

Mean appeal ratings for all student groups were above 2.43 on a 3-point scale. Students rated the show overall and animation segments higher than "Scoops' Place" or "City Flats." Black students rated all areas higher than non-target students, and Latino students rated all areas but "City Flats" and animation higher than non-target students. Girls rated the show overall and "Brownstone" segments higher than boys. There were no other differences between boys and girls, or between age groups.

Fewer teachers (60%) rated Show D educationally effective; 70% rated the overall presentation good or outstanding. Teachers' ratings were highest on the Language (85%), Technical Reception (81%), and Math Attitudes (81%) Subscales; and lowest on the Program Guide (72%), Student Appeal (71%), Social Attitudes (69%), and Math Content (65%) Subscales. Areas which teachers specified as needing improvement were: language (22%), voices (22%), more visuals (22%), and math content (24%).

Twenty classes engaged in related activities before and/or after the show. Most of these (79%) were discussions; 75% dealt with the math content, and 15% dealt with cultural or social ideas.

7. SHOW D

Introduction

The math topic for Show D is mapping and scaling. Show D introduces the concept of scaling, and demonstrates how maps are used to plan routes. The relationships between maps and reality are stressed. Some highlights are:

-- In "City Flats," the children learn about scaling as they paint a large wall mural from a small sketch;
-- In "Scoops' Place," Sister Stokes uses a map to plan the parade route for a rally;
-- A film documentary shows how two children use landmarks on a map to find their way around an amusement park.

The Program Guide for Show D can be found in Appendix M.

Student Response Forms were completed by 834 students in 39 classes. Student attention data were collected from 35 classes, and 37 teachers completed Teacher Weekly Questionnaires. Five visitors reported some audio or video problems.

Results and Discussion

Attention. Figure 7.1 is a graph of the mean percentage of students attending to and actively responding to each 15-second segment of Show D. The mean percentage of attention for the show overall and for the major segments of the show is summarized in Appendix Q, Table Q.1.

SHOW D N = 35 CLASSES

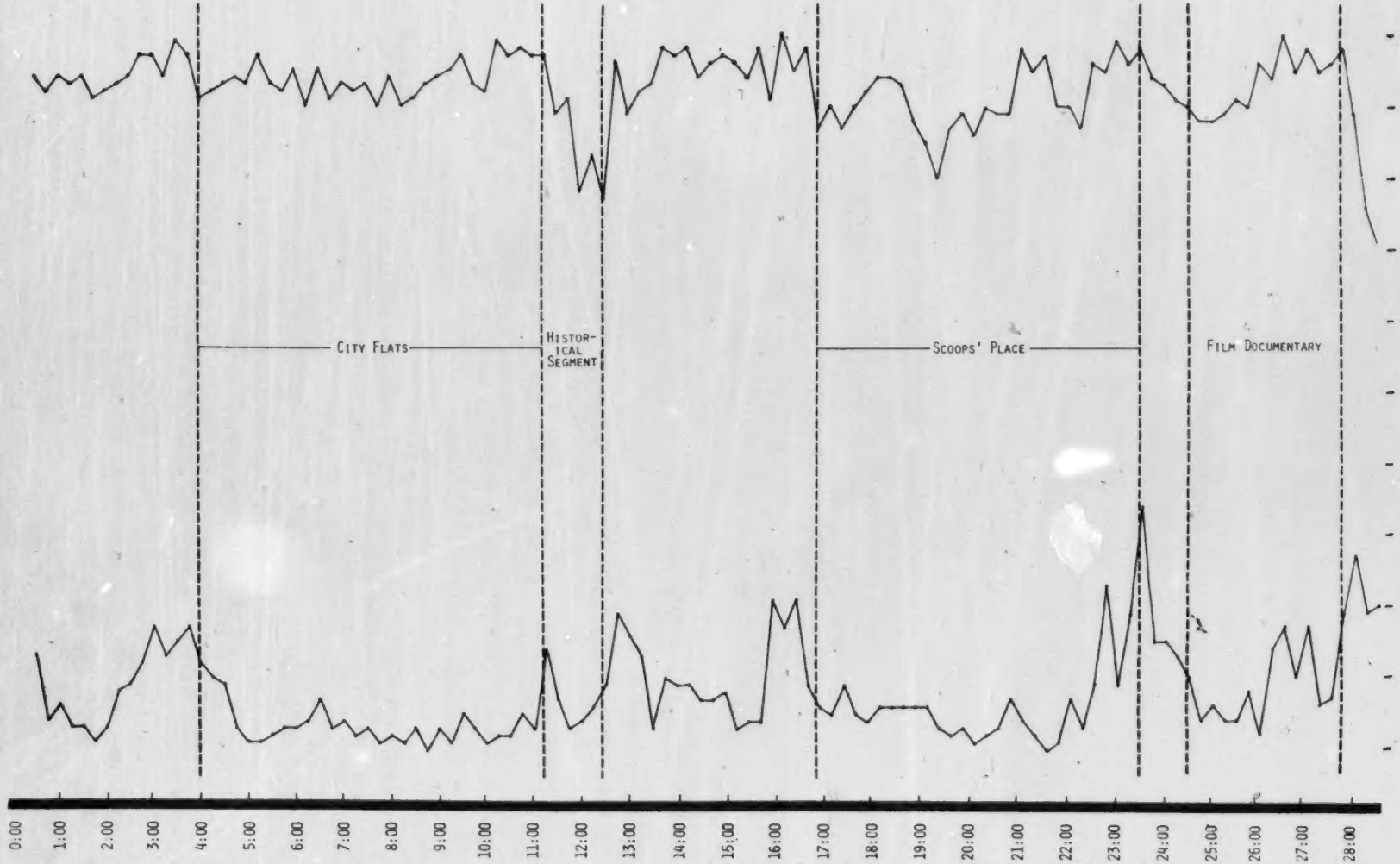

Figure 7.1

Overall student attention was quite high (mean = 91%). Attention declined during the "Scoops' Place" segment (mean = 86%), and during the historical segment (mean = 82%).

Appeal. Students' ratings of overall show appeal and major segments of Show D are shown in Appendix Q, Tables Q.2 to Q.6. These data are summarized below in Table 7.1.

Table 7.1

Mean Student Appeal Ratings: Show D

Group	Show Overall	Segment			
		Brownstone Segments	City Flats	Scoops' Place	Animation Segments
Ethnic Group					
Black Students	2.80	2.74	2.67	2.71	2.76
Latino Students	2.71	2.67	2.62	2.64	2.72
Non-Target Students	2.58	2.53	2.57	2.51	2.66
Age					
Younger Students	2.75	2.69	2.61	2.64	2.71
Older Students	2.68	2.64	2.65	2.62	2.74
Sex					
Boys	2.66	2.61	2.62	2.59	2.70
Girls	2.76	2.70	2.64	2.67	2.75
Total	2.72	2.66	2.63	2.63	2.72

Note. Differences larger than .10 on the 3-point scale were considered substantial differences.

The following patterns are of interest in the appeal data for Show D:

1. mean ratings for the show overall and animation segments are substantially higher than for "Scoops' Place" or "City Flats":
2. Black students rated all areas substantially higher than non-target students, and Latino students rated all areas but animation segments and "City Flats" higher than non-target students.

Teacher Responses. Appendix Q, Table Q.7 presents teachers' responses on the Teacher Weekly Questionnaire for Show D.

Twenty-two teachers (60%) rated Show D educationally effective. Ten teachers (27%) rated the overall presentation of Show D outstanding, 16 (43%) rated it good, 10 (27%) rated it mediocre, and 1 (3%) did not rate the program.

Teachers rated Show D highest on the language (85%), Technical Reception (81%), and Math Attitudes (81%) Subscales. Show D was rated lower on Program Presentation (77%), Student Attention (73%), Program Guide (72%), Student Appeal (71%), Social Attitudes (69%), and Math Content (65%) Subscales.

Five of the 12 suggested program areas listed for improvement were checked by more than 22% of the teachers: language (22%), voices (22%), more visuals (22%), more action (22%), and math content (24%).

Twenty-four teachers (65%) offered additional comments. These included:

-- general positive comments (4 teachers);
-- beginning of show too slow (4);
-- too much Spanish for non-Spanish students (2);
-- content too easy (2);

Of particular note in teachers' responses to Show D are the following:

1. Teachers rated Show D considerably higher on the Math Attitude Subscale than on the Math Content Subscale.
2. The problems with the use of language, diction of cast members, and audio quality, noted in previous shows are of continued concern to about 20% of the teachers.
3. A number of teachers (22%) asked for a more visual presentation.

Related Activities. Sixteen classroom teachers (43%) participated in a related classroom activity and/or discussion before viewing Show D (see Appendix Q, Table Q.8). In those 16 classrooms, there were 14 discussions, 1 activity, and 1 planned lesson. Nine teachers (24%) used suggestions from the Program Guide.

Twelve teachers (32%) participated in a related classroom activity and/or discussion immediately after viewing Program D with their classes. There were eight discussions, three activities, and one planned lesson.

Nineteen teachers (48%) reported they had conducted a math content-related activity during the week following the program.

Of the twenty teachers (54%) who participated in a related activity and/or discussion before, after, or both before and after their classes viewed Show D: 15 dealt with the math content of the program, 1 teacher dealt with the cultural aspects of the program, and 2 teachers dealt with other attitudinal aspects of the program.

Of particular interest are the following results:

1. The finding that more than half the teachers conducted related activities either just before or just after the program, and about half conducted related activities at other times during the week indicates the effectiveness of the program in motivating students and teachers toward mapping and scaling.
2. Most activities were math-related; only three teachers reported dealing with cultural or attitudinal areas of the program.

ABSTRACT

Show E: Evaluation Report

The math topic for Show E is graphing. Data were collected from 724 students in 37 classes, and from 35 of the 37 teachers.

The mean percentage of attention for Show E was 91%. Attention declined during the historical segment, and there was a substantial downward trend in attention over the four "Math Fact" segments.

Mean appeal ratings for all groups were above 2.37 on a 3-point scale. All five areas were rated about equally. Black and Latino students rated the "Brownstone" segments higher than non-target students. "Scoops' Place" was rated higher by Black students than by non-target students, and higher by older than by younger students. Girls rated the show overall higher than boys. There were no other substantial differences among ethnic groups, ages, or sexes.

Most teachers (80%) rated Show E educationally effective; 77% rated the overall presentation good or outstanding. Teachers' ratings were highest on the Student Attention (90%) and Language (89%) Subscales, and lowest on the Program Guide Subscale (69%). All other subscales were rated equally (81%). Areas which teachers specified as needing improvement were: voices (20%), more visuals (20%), and math content (17%).

Fifteen classes (44%) engaged in related activities before and/or after Show E, fewer than in previous weeks. Although most of these (87%) dealt with math content, the relative percentage of those dealing with cultural or social areas (27%) increased over previous shows.

8. SHOW E

Introduction

The math topic for Show E is graphing. The show introduces graphs as a useful tool for recording and looking at information. The use of graphs for showing a relationship between two variables is stressed. Some highlights are:

-- In an animated segment, a caterpillar uses coordinates to find a leaf on a graph;
-- In "Scoops' Place," Donna uses a graph to show that she runs fast enough to be on the boys' track team;
-- In "City Flats," Apple draws a wrong conclusion from a graph of the store's daily profits.

The Program Guide for Show E can be found in Appendix M.

Student Response Forms were completed by 724 students in 37 classes. Student attention data were collected from 33 classes, and 35 teachers completed Teacher Weekly Questionnaires. Two classes did not participate because of a field trip. In one city Show E was broadcast during the wrong week; since students, visitors, and teachers did not have the appropriate forms for this program, some loss of data resulted.

Results and Discussion

Attention. Figure 8.1 is a graph of the mean percentage of students attending to and actively responding to each 15-second segment of Show E. Descriptive attention data for the show overall and for the major segments of the show are shown in Appendix R, Table R.1.

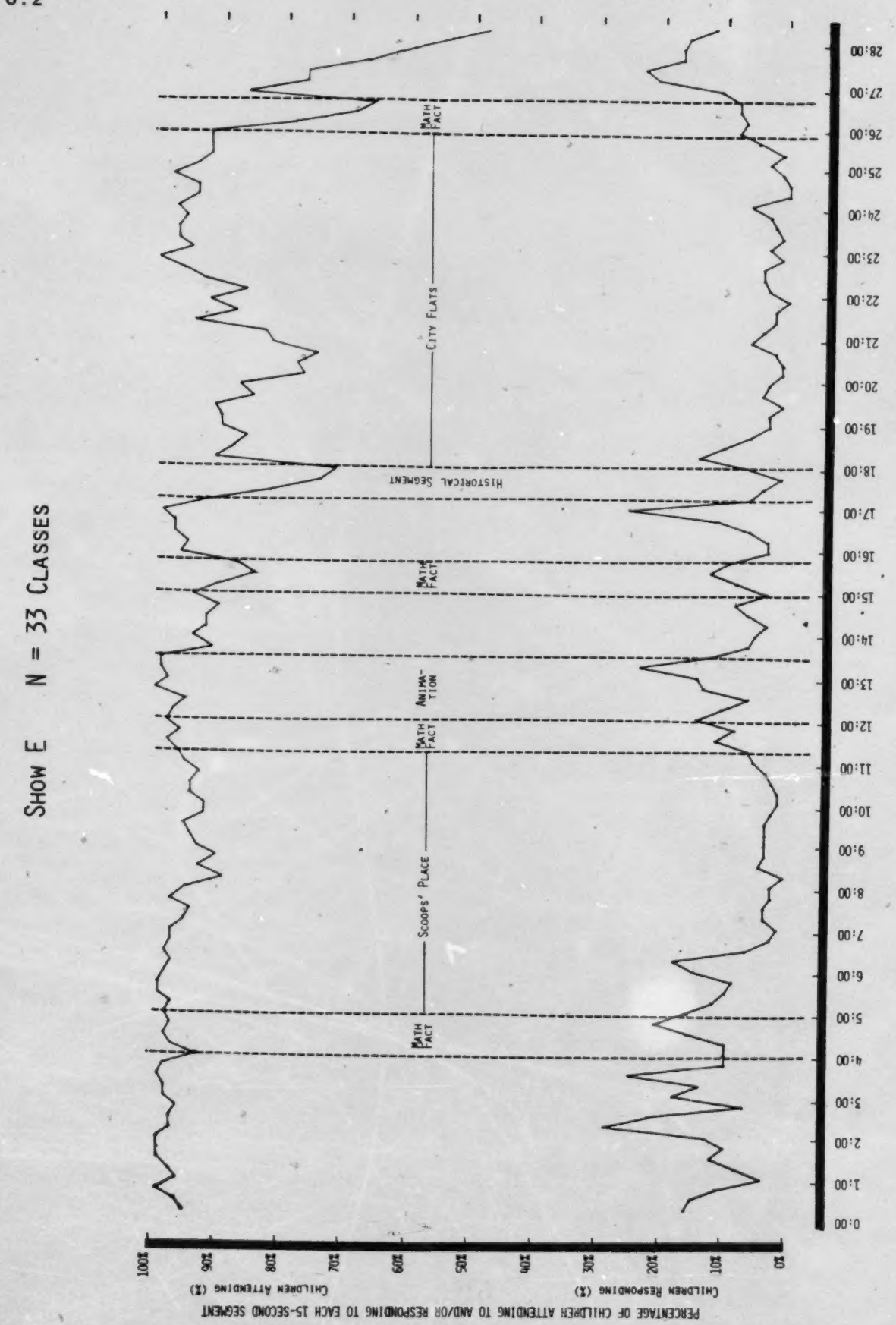
SHOW E N = 33 CLASSES
PERCENTAGE OF CHILDREN ATTENDING TO AND/OR RESPONDING TO EACH 15-SECOND SEGMENT
CHILDREN RESPONDING (%)
CHILDREN ATTENDING (%)
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
0:00
1:00
2:00
3:00
4:00
5:00
6:00
7:00
8:00
9:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
24:00
25:00
26:00
27:00
28:00
MATH FACT
SCOOPS' PLACE
MATH FACT
ANIMA-TION
MATH FACT
HISTORICAL SEGMENT
CITY FLATS
MATH FACT

Figure 8.1

The mean percentage of attention for the show overall was 91%. Attention was relatively high during "Scoops' Place" (mean = 94%). Attention declined during the historical segment (mean = 79%). There was a substantial downward trend in attention over the four "Math Fact" segments (means = 96%, 97%, 85%, and 71%, respectively).

The results of the student attention data are in agreement with the reports of visitors that the "night club" scene used in the "Math Fact" segments for this show was very unpopular with students.

Appeal. Students' ratings of appeal for the show overall and major segments of Show E are shown in Appendix R, Tables R.2 to R.6. These data are summarized in Table 8.1 on the following page.

The appeal data for Show E are noteworthy for their relative lack of variability among ethnic groups, ages, or sexes. Show E had the most uniform appeal across sample subgroups of the eight shows evaluated.

Table 8.1

Mean Student Appeal Ratings: Show E

Group	Show Overall	Segment			
		Brownstone Segments	City Flats	Scoops' Place	Animation Segments
Ethnic Group					
Black Students	2.64	2.63	2.67	2.6[illegible]	2.72
Latino Students	2.58	2.55	2.61	2.54	2.67
Non-Target Students	2.59	2.46	2.59	2.52	2.68
Age					
Younger Students	2.60	2.54	2.62	2.51	2.65
Older Students	2.62	2.57	2.64	2.65	2.73
Sex					
Boys	2.56	2.52	2.65	2.53	2.70
Girls	2.65	2.59	2.61	2.61	2.68
Total	2.61	2.5[illegible]	2.63	2.57	2.69

Note. Differences larger than .10 on the 3-point scale were considered substantial differences.

Teacher Responses. Appendix R, Table R.7 presents teachers' responses on the Teacher Weekly Questionnaire for Show E.

Twenty-eight teachers (80%) rated Show E educationally effective. Nine teachers (26%) rated the overall presentation of Show E outstanding, 24 teachers (69%) rated it good, 1 (3%) rated it mediocre, and 1 teacher did not rate the program.

Teachers' ratings on the Student Attention (90%) and Language (89%) Subscales were relatively high. Ratings on the Program Guide Subscale were relatively low (69%). All other subscales were rated equally (81%).

Only 3 of the 12 suggested program areas listed for improvement were checked by more than 12% of teachers: voices (20%), more visuals (20%), and math content (17%).

Twenty-two teachers (63%) offered additional comments about the program. Three teachers (9%) reported difficulty in hearing the lyrics above the music. Two teachers (6%) mentioned that the visuals of Show E were good, and two teachers mentioned that the animation was very good. Two teachers reported that the Spanish language is lost for the non-Spanish-speaking students. Two teachers reported that their students didn't like the historical segment and two reported that the "Math Facts" segment did not hold student interest.

Of particular importance on teachers' responses to Show E:

1. Math Content, Social Attitudes, and Math Attitudes Subscale scores were nearly equal, whereas in previous shows Math Attitudes Subscale scores were generally higher than Math Content or Social Attitudes Subscale scores.
2. Program Guides Subscale scores were considerably lower than other Subscale scores.

Related Activities. Ten classroom teachers (29%) participated in a related classroom activity and/or discussion before viewing Show E (see Appendix R, Table R.8). In those ten classrooms, there were eight discussions, three activities, and one planned lesson. Six teachers used suggestions from the Program Guide.

Nine teachers (27%) participated in a related classroom activity and/or discussion immediately after viewing Show E. There were six activities and four discussions reported.

Ten teachers (29%) reported that they conducted a math-related activity during the week following the program.

Of the fifteen teachers (44%) who conducted a related activity and/or discussion before, after, or both before and after their students viewed Show E: 13 dealt with the math content of the program, 2 dealt with the cultural aspects of the program, and 2 dealt with the other attitudinal aspects of the program.

Of particular interest is the finding that although there were math-related activities in fewer classes than in previous weeks, about the same number of teachers dealt with cultural and attitudinal areas.

ABSTRACT

Show F: Evaluation Report

The math topic for Show F is estimation of quantity. Data were collected from 782 students in 39 classes, and from 35 of the 39 teachers.

The mean percentage of attention for Show F was 90%. Attention declined during the film documentary and historical segment.

Mean appeal ratings for all areas and for all student groups were above 2.48 on a 3-point scale. Girls rated the "Brownstone" segments, "City Flats," and "Scoops' Place" higher than boys. Younger students rated "Brownstone" segments higher than older students. Black students rated the show overall and "Scoops' Place" higher than non-target students. Black and Latino students rated "Brownstone" segments higher than non-target students.

Most teachers (74%) rated Show F educationally effective; 77% rated the overall presentation good or outstanding. Teachers' ratings were highest on the Student Attention (93%), Language (90%), and Program Presentation (82%) Subscales; and lowest on the Math Content (73%), Social Attitudes (67%), and Program Guides (60%) Subscales. Areas which teachers specified as needing improvement were: math content (26%), voices (17%), Program Guides (17%), and more visuals (14%).

Thirteen classes (31%) engaged in related activities before and/or after Show F, a decline from previous shows. Most of these (92%) dealt with the math content; only one dealt with social or cultural areas of the show.

9. SHOW F

Introduction

The math topic for Show F is estimation of quantity. The show demonstrates many ways in which people can estimate quantity. The usefulness of estimation as a tool for making everyday judgments about "how many" and "how much" is stressed. Some highlights are:

- -- In an animation segment, two fleas estimate the number of hairs on a dog;
- -- In "City Flats," Apple, Loli, and their mother use a scale to estimate the number of chocolate squares in a basket;
- -- In an animation segment, a woman estimates the height and weight of her two-year-old monster;
- -- In "Scoops' Place," Scoops, Miss Marie, and Sister Stokes estimate whether Scoops' Place can hold 45 people for a meeting.

The Program Guide for Show F can be found in Appendix M.

Student Response Forms were completed by 782 students in 39 classes. Student attention data were collected from 29 classes, and 35 teachers completed Teacher Weekly Questionnaires. In one city, Show F was broadcast during the wrong week; and since students, teachers, and visitors did not have the appropriate forms for this program, some loss of data resulted. Five visitors reported audio or video problems.

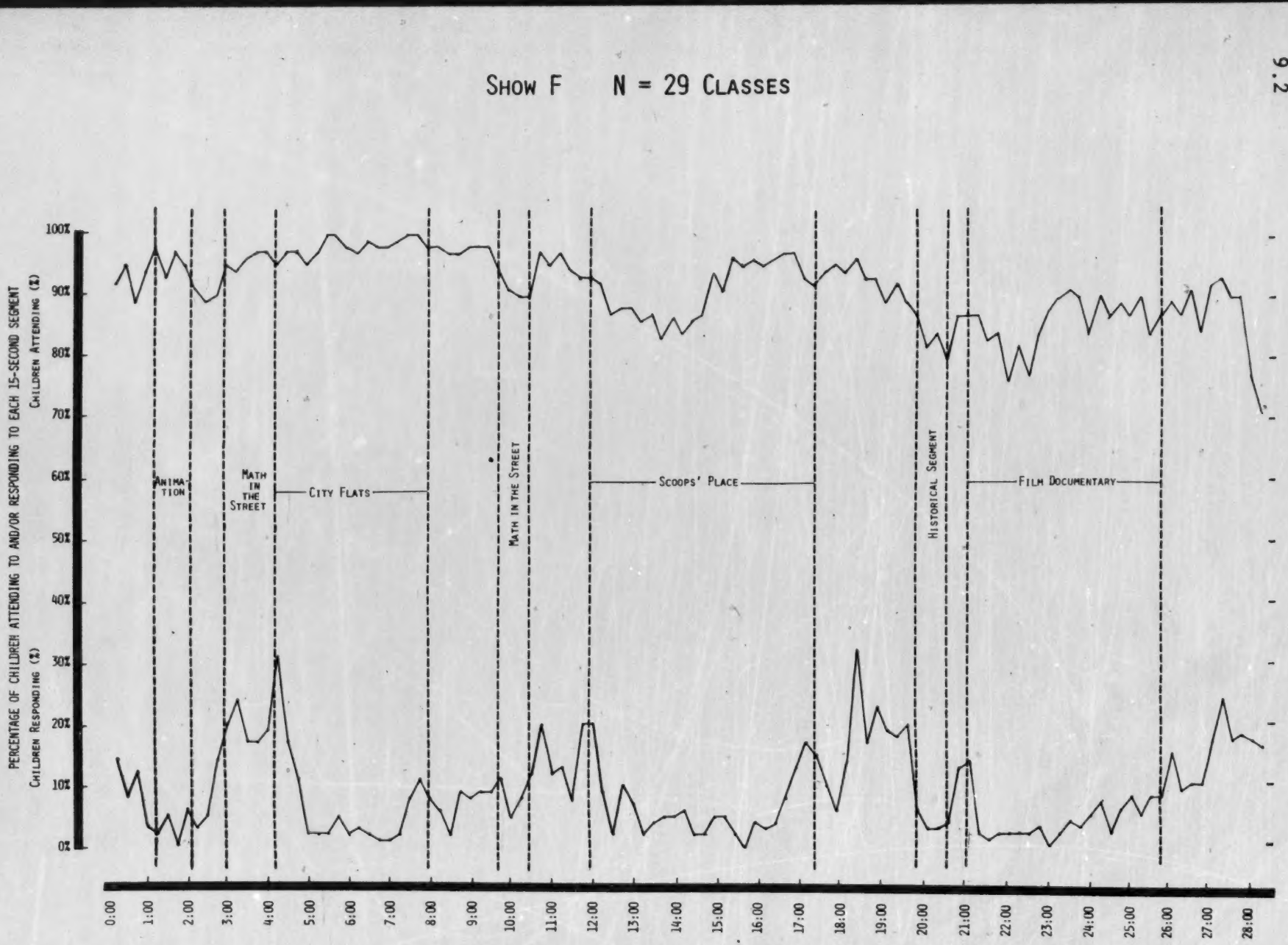
SHOW F N = 29 CLASSES
PERCENTAGE OF CHILDREN ATTENDING TO AND/OR RESPONDING TO EACH 15-SECOND SEGMENT
CHILDREN ATTENDING (%)
CHILDREN RESPONDING (%)
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
ANIMATION
MATH IN THE STREET
CITY FLATS
MATH IN THE STREET
SCOOPS' PLACE
HISTORICAL SEGMENT
FILM DOCUMENTARY
0:00
1:00
2:00
3:00
4:00
5:00
6:00
7:00
8:00
9:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
24:00
25:00
26:00
27:00
28:00

Figure 9.1

Results and Discussion

Attention. Figure 9.1 is a graph of the mean percentage of students attending to and actively responding to each 15-second segment of Show F. Descriptive attention data for the show overall and for the major segments of the show are shown in Appendix S, Table S.1.

The overall attention was quite high (mean = 90%). Attention declined during the film documentary (mean = 84%), and during the historical segment (mean = 82%). Attention during "City Flats" (mean = 96%) was relatively higher than for the show overall.

Appeal. Students' ratings of overall appeal and major segments of Show F are shown in Appendix S, Tables S.2 to S.6. These data are summarized in Table 9.1 on the following page.

Of particular note for Show F is the finding that girls rated the appeal of "Brownstone" segments, "Scoops' Place," and "City Flats," but not the show overall, higher than boys.

Table 9.1

Mean Student Appeal Ratings: Show F

Group	Show Overall	Segments			
		Brownstone Segments	City Flats	Scoops' Place	Animation Segments
Ethnic Group					
Black Students	2.77	2.70	2.68	2.69	2.75
Latino Students	2.70	2.64	2.69	2.63	2.81
Non-Target Students	2.65	2.52	2.64	2.59	2.74
Age					
Younger Students	2.75	2.70	2.69	2.66	2.77
Older Students	2.68	2.57	2.66	2.63	2.77
Sex					
Boys	2.68	2.56	2.62	2.59	2.76
Girls	2.74	2.70	2.72	2.69	2.77
Total	2.71	2.64	2.67	2.64	2.77

Note. Differences larger than .10 on the 3-point scale were considered substantial differences.

Teacher Responses. Appendix S, Table S.7 presents teachers' responses on the Teacher Weekly Questionnaire for Show F.

Twenty-six teachers (74%) rated Show F educationally effective. Eleven teachers (31%) rated the overall presentation of Show F outstanding, 16 teachers (46%) rated it good, 7 (20%) rated it mediocre, and 1 (3%) rated it poor.

Scores on the Student Attention (93%) and Language (90%) Subscales were relatively high; Social Attitude (67%) and Program Guides (60%) Subscale scores were relatively low. All other subscale scores were between 73% and 82%.

Of the 12 suggested program areas listed for improvement, four were checked by more than 12% of the teachers: math content (26%), voices (17%), program guides (17%), and more visuals (14%).

Twenty-five teachers (71%) made additional comments about the program. These comments included:

-- program holds student attention (3 teachers);
-- too much dancing (3);
-- this program had more math content (2);
-- students don't enjoy historical segment (2).

Of interest in teachers' responses to Show F are:

1. Social Attitudes and Program Guide Subscale scores continue to be lower than other subscales, as in most previous shows;
2. A number of teachers continue to report that math content (26%) and voices (22%) need improvement.

Related Activities. Seven teachers (19%) conducted a related classroom activity and/or discussion before viewing Show F (see Appendix S, Table S.8). In those seven classrooms, there were seven discussions, one activity, and one planned lesson. All seven classroom teachers used suggestions from the Program Guide in preparing their classes for the program.

Eleven teachers (31%) conducted a related classroom activity and/or discussion immediately after viewing Show F with their students. In those 11 classes, there were 9 discussions, 2 activities, and 2 planned lessons. Suggestions from the Program Guide were used in 8 of the 11 classes.

Four teachers (11%) reported that during the week following Show F, their classes engaged in activities related to estimation and two teachers (6%) reported that they discussed approximation with their students.

Of the 13 teachers (31%) who conducted a related activity and/or discussion before, after, or both before and after their classes viewed Show F: 12 (92%) dealt with the math content of the program, one (8%) dealt with the cultural aspects of the program, and none dealt with the other attitudinal aspects of the program.

Of particular note is the finding that relatively fewer teachers conducted related activities in the sixth week. A fatigue factor may be operating as teachers near the end of the evaluation study.

ABSTRACT

Show G: Evaluation Report

The math topic for Show G is measurement of weight. Data were collected from 784 students in 39 classes, and from 35 of the 39 teachers.

The mean percentage of attention for Show G was 89%. Attention declined during the historical segment; there were downward trends in attention over the two "Math in the Street" segments and over the four "Math Fact" segments in show G.

Mean appeal ratings for all areas and for all student groups were above 2.16 on a 3-point scale. All groups rated animation segments equally. Girls rated the other four areas higher than boys, and Latino students rated the other four areas higher than non-target students. Black students rated the show overall, "Brownstone" segments, and "Scoops' Place" higher than non-target students. Ratings for the show overall were higher for younger than for older students; there were no other age differences.

Fewer teachers (67%) rated Show G educationally effective; 62% rated the overall presentation good or outstanding. Teachers' ratings were highest on the Language (88%), Technical Reception (81%), and Math Attitudes (81%) Subscales; and lowest on the Program Presentation (74%), Social Attitudes (73%), and Program Guide (62%) Subscales. Areas which teachers specified as needing improvement included: more visuals (28%), math content (25%), voices (25%), and dramatizations (19%).

Fifteen classes engaged in related acivities before and/or after Show G. Most of these were discussions, and only one teacher dealt with cultural or social aspects of the show.

10. SHOW G

Introduction

The math topic for Show G is measurement of weight. Show G introduces the gram and kilogram as metric units of weight, and demonstrates the conversion between kilograms and pounds. Some highlights are:

-- In an animation segment, a little girl weighs her trunks at the airport;
-- In "Scoops' Place," metric weights confuse Miss Marie when she weighs her luggage for a trip to Africa;
-- In "City Flats," Apple thinks his father's new scale is broken until he finds out it weighs in kilograms, not pounds.

The Program Guide for Show G can be found in Appendix M.

Student Response Forms were collected from 784 students in 39 classes. Student attention data were collected from 38 classes, and 35 teachers completed Teacher Weekly Questionnaires. Five visitors reported video problems.

Results and Discussion

Attention. Figure 10.1 is a graph of the mean percentage of students attending to and actively responding to each 15-second segment of Show G. Descriptive attention data for the show overall and for the major segments of the show are shown in Appendix T, Table T.1.

Student attention for the show overall was quite high (mean = 89%). Attention during "City Flats" (mean = 94%) was relatively higher than for the show

10.2

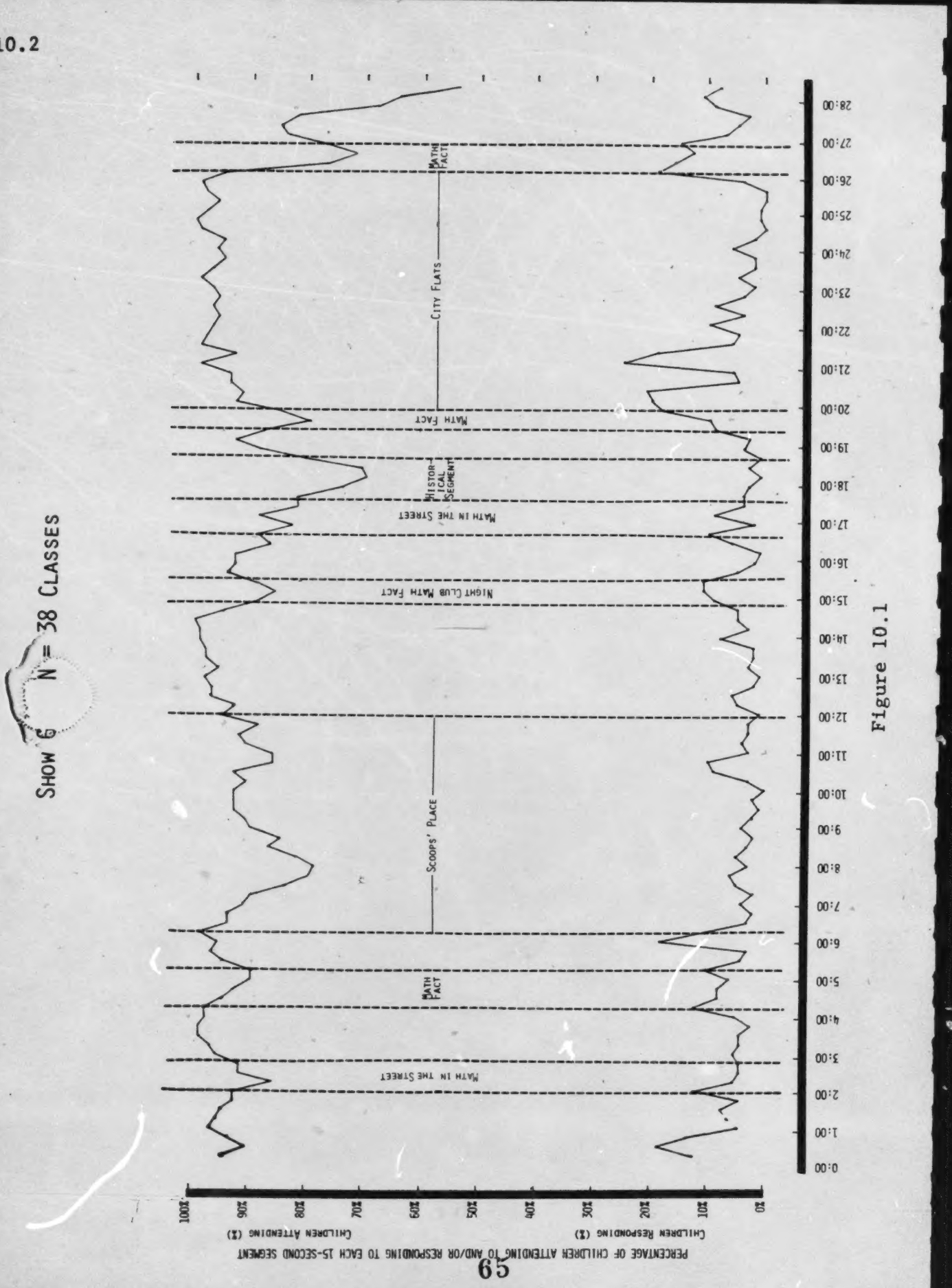

Figure 10.1

overall. Attention declined considerably during the historical segment (mean = 74%). There was a downward trend in attention over the two "Math in the Street" segments (means = 89% and 84%, respectively). There was a considerable decline in attention (to 77%) during the second minute of "Scoops' Place," although the mean percentage of attention for this segment (87%) was close to the mean percentage for the show overall.

There was a substantial downward trend in attention over the four "Math Fact" segments (means = 91%, 86%, 82%, and 74%, respectively).

The results of the student attention data are in agreement with visitors' reports that the "night club" scene used in the "Math Fact" segments did not appeal to students. The same downward trend in attention was reported in Show E, where the "night club" scene in the "Math Fact" segments was also used. No substantial decline in student attention occurred during "Math Fact" segments in the other six programs.

Appeal. Students' appeal ratings for the show overall and major segments of Show G are shown in Appendix T, Tables T.2 to T.6. These data are summarized in Table 10.1. on the following page.

Three findings on Show G are of particular interest:

1. Girls' appeal ratings were substantially higher than boys' in all areas but animation, where there was no substantial difference;
2. Latino students' ratings were substantially higher than non-target students in all areas except animation, where there was no substantial difference;

3. Black students' appeal ratings were substantially higher than non-target students' for the show overall, "Brownstone" segments, and "Scoops' Place."

Table 10.1

Mean Student Appeal Ratings: Show G

Group	Part of Show				
	Show Overall	Brownstone Segments	City Flats	Scoops' Place	Animation Segments
Ethnic Group					
Black Students	2.61	2.56	2.56	2.64	2.60
Latino Students	2.56	2.43	2.61	2.49	2.63
Non-Target Students	2.38	2.32	2.49	2.37	2.57
Age					
Younger Students	2.59	2.49	2.59	2.52	2.61
Older Students	2.48	2.42	2.52	2.53	2.59
Sex					
Boys	2.46	2.36	2.51	2.45	2.56
Girls	2.60	2.54	2.60	2.59	2.64
Total	2.54	2.46	2.56	2.53	2.60

Note. Differences larger than .10 on the 3-point scale were considered substantial differences.

Teacher Responses. Appendix T, Table T.7 presents teachers' responses on the Teacher Weekly Questionnaire for Show G.

Twenty-four teachers (67%) reported that this program was educationally effective. Three teachers (8%) rated the overall presentation of Show G outstanding, 20 teachers (56%) rated it good, 8 (22%) rated it mediocre, 3 (8%) rated it poor, and 2 (6%) did not rate the program.

Teachers rated Show G highest on the Language Subscale (88%); they rated Show G lowest on the Program Guides Subscale (62%). Other subscale scores were: Technical Quality (81%); Math Attitudes (81%); Student Attention (78%); Program Appeal (76%); Math Content (75%); Program Presentation (74%); and Social Attitudes (73%).

Of the 12 suggested program areas listed for improvement four were checked by more than 8% of the teachers: more visuals (28%); voices (25%); math content (25%); and dramatizations (19%).

Twenty-four teachers (67%) offered additional comments about the program. These included:

-- programs are getting repetitive (7 teachers);
-- attention lost during singing "Math Fact" segments (4)
-- not enough math content (3).

Of special interest in teachers's responses to Show G are the following:

1. Teachers' ratings were higher on the Math Attitudes Subscale than on the Math Content Subscale
2. More teachers commented on presentation aspects of the program than in previous weeks, commenting on particular segments or on the amount of material repeated;
3. Although teachers rated Show G higher on the Language Subscale than on other subscales,

indicating they considered the vocabulary level and language used appropriate, a number of teachers (25%) checked voices as an area needing improvement. It appears that language-related problems with the programs are due more to poor audio signal and the diction of some cast members than to use of non-standard English;

Related Activities. Eleven classroom teachers (30%) conducted a related classroom activity and/or discussion before viewing Show G (see Appendix T, Table T.8). In those 11 classes, there were 9 discussions, 2 activities, and 2 planned lessons. Eight teachers used suggestions from the Program Guide.

Ten teachers (27%) conducted a related classroom activity and/or discussion immediately after viewing Show G with their classes. There were five discussions, four activities, and two planned lessons in those ten classes.

Seven teachers (19%) reported that they conducted math content-related activities during the week following Show G.

Of the fifteen teachers (40%) who conducted a related activity and/or discussion before, after, or both before and after their classes viewed Show G: 13 teachers dealt with the math content of the program, one dealt with the cultural aspects of the program, and none dealt with other attitudinal aspects of the program.

Of special interest for Show G are the following:

1. The number of teachers conducting related activities remains near the 40% level;
2. Most teachers dealt with the math content; only a small number of teachers dealt with cultural or other attitudinal areas of Show G.

ABSTRACT

Show H: Evaluation Report

The math topic for Show H is mapping and scaling. Data were collected from 817 students in 38 classes, and from 37 of the 38 teachers.

The mean percentage of attention for the show overall was quite high (92%), and declined slightly only during the historical segment.

Mean appeal ratings for all student groups were above 2.23 on a 3-point scale for all five areas. The mean rating for the "Brownstone" segments was lower than any other area. There were no differences among ethnic groups, ages, or boys and girls on appeal ratings for "City Flats" and animation segments. Black students rated the "Brownstone" segments higher than Latino and non-target students, and they rated "Scoops' Place" higher than Latino students. Girls rated the show overall, "Brownstone" segments, and "Scoops' Place" higher than boys. Younger students rated the "Brownstone" segments higher than older students.

Most teachers (78%) rated Show H educationally effective; 92% rated the overall presentation good or outstanding. Teachers' ratings were highest on the Language (91%), Technical Reception (89%), and Student Attention (85% Subscales; and lowest on the Social Attitudes (76%), Math Content (72%), and Grogram Guide (53%) Subscales. Areas which teachers specified as needing improvement included: math content (22%), more action (22%), and more visuals (19%).

Fifteen classes engaged in related activities before and/or after Show H. Of these, 93% dealt with the math content, and 20% dealt with social or cultural aspects of the show.

11. SHOW H

Introduction

The math topic for Show H is mapping and scaling. The show applies the concepts of scaling and proportion to maps, and demonstrates the use of the scale in calculating distances on a map. Some highlights are:

-- In "City Flats," Apple and Cindy, on a bicycle trip, discover their map is wrongly drawn;
-- In an animated segment, Mapman rescues a lost traveler by showing him how to read the scale on his map;
-- In "Scoops' Place," Gregory helps Albert make scale plans for a doghouse; then Scoops shows them how just changing the scale can make the doghouse bigger;
-- In a film documentary, a blind boy uses a "tactile" map, a map he can feel, to find his way around.

The Program Guide for Show H can be found in Appendix M.

Student Response Forms were completed by 817 students in 38 classes. Student attention data were reported for 38 classes, and 37 teachers completed the Teacher Weekly Questionnaires. Data were not collected from one class although that class viewed the program, because the visitor was absent. Six visitors reported video or audio problems.

Results and Discussion

Attention. Figure 11.1 is a graph of the mean percentage of students attending to and actively responding to

SHOW H N = 38 CLASSES

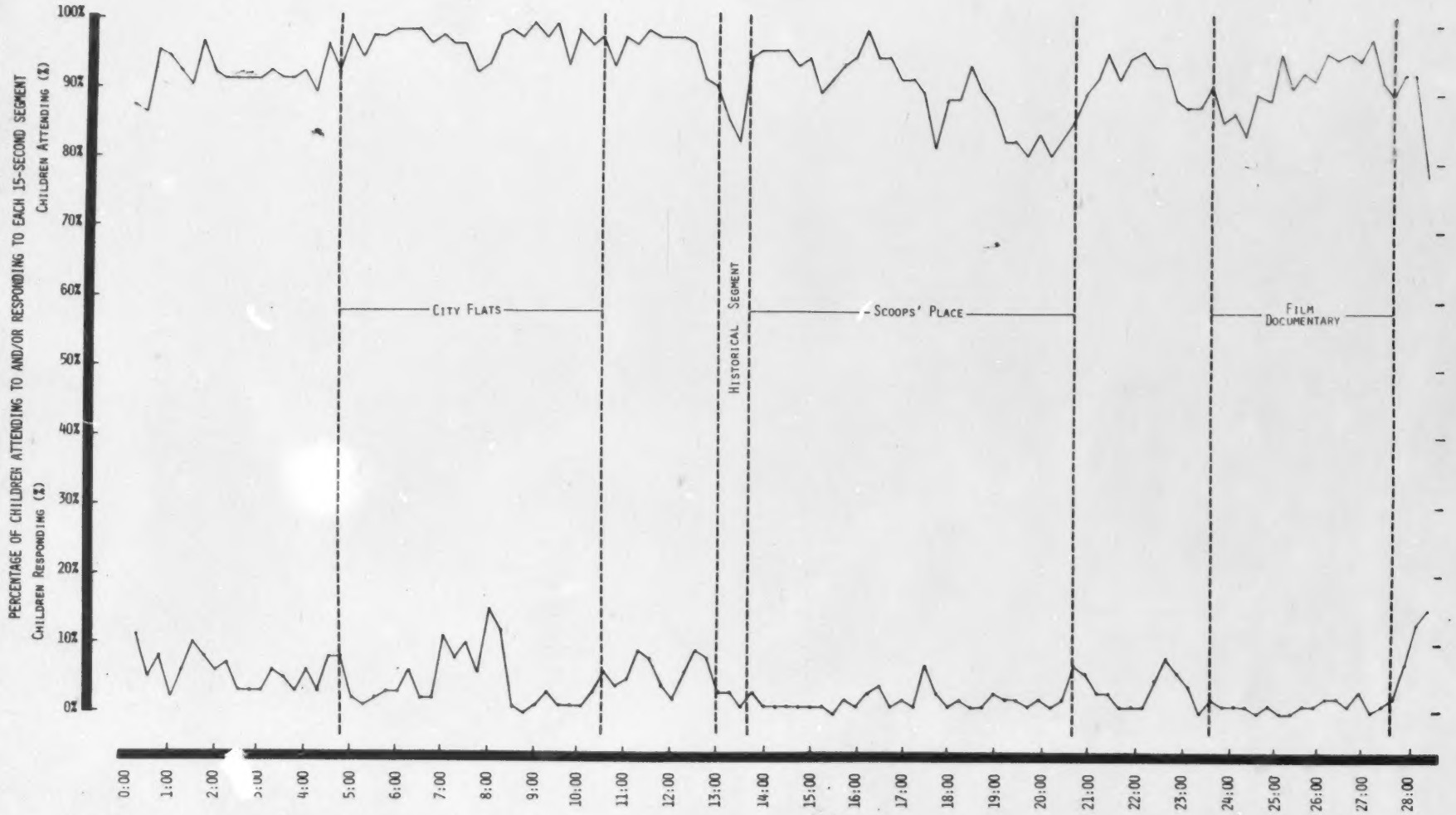

Figure 11.1

each 15-second segment of Show H. Descriptive attention data for the show overall and major segments are shown in Appendix U, Table U.1.

Student attention for the show overall was quite high (mean = 92%). Student attention remained at a fairly constant level throughout the show, with the exception of a slight decline during the historical segment (mean = 85%).

Appeal. Students' ratings of appeal for Show H overall and for major segments of Show H are shown in Appendix U, Tables U.2 to U.6. These data are summarized in Table 11.1 below.

Table 11.1

Mean Student Appeal Ratings: Show H

Group	Show Overall	Segment			
		Brownstone Segments	City Flats	Scoops' Place	Animation Segments
Ethnic Group					
Black Students	2.62	2.60	2.61	2.65	2.66
Latino Students	2.55	2.43	2.69	2.56	2.62
Non-Target Students	2.60	2.39	2.64	2.58	2.61
Age					
Younger Students	2.63	2.57	2.63	2.62	2.65
Older Students	2.55	2.39	2.65	2.57	2.62
Sex					
Boys	2.51	2.36	2.60	2.54	2.64
Girls	2.66	2.60	2.68	2.65	2.63
Total	2.59	2.49	2.64	2.60	2.63

Note. Differences larger than .10 on the 3-point scale were considered substantial differences.

Three findings of interest in the appeal data for Show H are:

1. "City Flats" appealed uniformly to all ethnic groups, ages, and sexes;
2. Girls' appeal ratings were substantially higher than boys' for all areas except "Brownstone" segments and animation segments, where there were no differences;
3. The mean appeal rating for the "Brownstone" segments was substantially lower than all other areas rated.

Teacher Responses. Appendix U, Table U.7 presents teachers' responses on the Teacher Weekly Questionnaire for Show H.

Twenty-nine teachers (78%) rated Show H as educationally effective. Eleven teachers (30%) rated the overall presentation of Show H outstanding, 23 (62%) rated it good, and 3 (8%) rated it mediocre.

Teachers rated Show H highly on the Language (91%) and Technical Quality (89%) Subscales; they rated Show H very low on the Program Guides Subscale (53%). Scores on other subscales were: Student Attention (85%); Program Appeal (81%); Program Presentation (81%); Math Attitudes (80%); Social Attitudes (76%); and Math Content (72%).

Of the 12 suggested program areas listed for improvement, 3 were checked by more than 15% of the teachers: more visuals (19%); more action (22%); and math content (22%).

Twenty-two teachers (60%) offered additional comments about the program. Five teachers (14%) reported that students really enjoyed the film documentary "Tactile Map," and 3 teachers (8%) reported that Show H was very good and most effective.

Of particular note on teachers' responses to Show H:

1. Teachers' responses to Show H were generally more positive than to previous shows;
2. The Language Subscale rating continued to be high, but fewer teachers commented negatively about voices;
3. The teachers continue to rate the Program Guide Subscale relatively lower than other subscales.

Related Activities. Nine classroom teachers (24%) conducted a related classroom activity and/or discussion before viewing Show H (see Appendix U, Table U.8.) In those nine classrooms, there were nine discussions, two planned lessons, and one activity. Seven of the nine teachers used suggestions from the Program Guide.

Eleven teachers (29%) conducted a related classroom activity and/or discussion after viewing Show H with their students. There were eight discussions, four activities, and two planned lessons.

Of the fifteen teachers (39%) who conducted a related activity and/or discussion before, after, or both before and after their classes viewed Show H: 14 dealt with the math content of the program, no teacher dealt with the cultural aspects of the program, and three teachers dealt with the other attitudinal aspects of the program.

Of particular note are the following results:

1. The number of teachers conducting activities related to Show H, the last show in the evaluation study, was still considerable (39%);
2. Teachers who conducted related activities dealt much more with math content than with social or cultural areas.

12. SUMMARY AND CONCLUSIONS

On the following pages, the major findings of the show-by-show analysis of the eight "Infinity Factory" programs will be summarized.

Student Attention

The mean percentage of student attention for the eight shows was very high (91.3%). Attention was relatively higher for Shows A and B, declined slightly for Show C (due in part to technical problems encountered by 12 classes), then stabilized near the 90% level for the remaining five shows.

Attention declined during the historical segments in six of the eight shows, and during the "Math in the Street" segments in three shows. There was a downward trend in attention over the "Math Fact" segments in both shows where the "night club" scene was used.

Student Appeal

Student appeal ratings for the show overall, "Brownstone" segments, "City Flats," "Scoops' Place," and animation segments were very high throughout the eight programs. The mean appeal rating for each show overall was above 2.54 on a 3-point scale (85%). No segment of any program was rated below 2.16 (71%) by any sample subgroup. Students rated the appeal of Shows A and B overall generally higher than major segments of those shows. Students rated the appeal of animation segments in most shows higher than other segments.

Appeal ratings for the shows overall, "Brownstone" segments, "City Flats," and "Scoops' Place" were comparable for Black and Latino students, and higher for these two groups than for non-target students. Appeal

ratings for the animation segments were generally comparable for all ethnic groups, age groups, and sexes.

However, appeal ratings were generally comparable for younger and older students. Girls' mean appeal ratings were higher than boys' for Shows B, D, E, G, and H overall; and for "Brownstone" segments in all shows except Show E.

Teacher Responses

The mean number of teachers rating each show educationally effective was 73%. Teachers rated the program consistently high on the Language and Student Attention Subscales, and consistently low on the Program Guides Subscale. Show C was rated generally lower than other shows on all subscales. The number of teachers specifying particular areas as needing improvement and teachers' comments are generally consistent with teachers' ratings on the various subscales.

Teachers rated Shows A, B, C, and H lower on the Math Content Subscale than on the Math Attitude Subscale. Ratings on the two subscales were comparable for other shows. These findings are consistent with teachers' comments, and are understandable considering the fact that the programs are designed for both home and school viewing, and a lower density of math content may be necessary in order to compete for the home viewing audience. Also, the programs are designed principally to introduce math topics, show their relevance, and raise students' interest in math; they were not designed to be a complete instructional package. It is expected that teachers would be able to develop and carry out further instructional activities which would capitalize on the interest developed through the television programs and complete the learning process which the programs helped begin.

Although the Language Subscale was consistently very high, about 35% of teachers checked voices as needing

improvement for the first three shows. This number dropped to about 20% for the last five shows. Teachers' comments indicate that the problem is not with the use of non-standard English, which most teachers considered appropriate within the context of the program, but with audio signal problems and the diction of some cast members. These problems were recognized and some improvements were made during production of the rest of the series.

Related Activities

About twenty classes (50%) engaged in related activities before and/or after the first four programs, and about 15% (40%) engaged in related activities before and/or after the last four programs. An overwhelming majority of these dealt only with the math content of the show. These findings indicate that more support would be necessary in order for teachers to become aware of and make use of the full range of educational opportunities -- cultural and social as well as math -- provided by the programs.

Conclusions

The program-by-program analysis indicates that student attention was maintained at a very high level for eight programs. Also, student appeal ratings of the shows overall and major segments were very high for all student groups, particularly for Black and Latino students; in addition teachers considered the programs to be entertaining as well as educationally effective for their students.

With the exception of Show C, results for the eight programs are comparable in all areas. Technical problems encountered by 12 classes may account in part for the relatively lower student attention, student appeal ratings, and teacher ratings received by Show C.

All of these findings support the conclusion that the eight "Infinity Factory" programs in general met their objectives in the areas of attention, appeal and teacher acceptance, and were well received in an educational setting.

13. RECOMMENDATIONS*

The "Infinity Factory" eight-show series was evaluated with over 1,000 students in Boston, Massachusetts; Lawrence, Massachusetts; New York, New York; and Los Angeles, California. The program series met with overall success as determined by measures of attention, appeal, comprehension, knowledge of math content, students' attitudes, and teacher responses. The following recommendations are made for distribution of the series, use in schools, ongoing production, and ongoing evaluation.

1. Dissemination efforts should stress the advantages of the series for a non-target audience as well as the target audience since evaluation findings indicate that non-target students liked the program and benefitted from math content presented in a multicultural context.
2. Dissemination efforts aimed toward schools should include more extensive orientation for teachers, with particular emphasis on the series' objectives (both math and cultural/social), the rationale for the series, and how the television programs and program guides can be used more effectively in schools.
3. The program guides should include more ways to develop positive social, cultural, and math attitudes in a classroom setting since many teachers rated the program very high in these areas but focussed mainly on math content in related classroom activities they conducted.
4. In ongoing production, special attention should be given to defining both math and cultural/social program objectives more clearly, and to carefully translating these objectives into program content.

---

*These recommendations are based on the findings of both Part I and Part II of the evaluation study, and on the experiences of the evaluators in conducting the study. The recommendations are also included as Section 6 of Part I.

5. Since the historical and "Math in the Street" segments did not hold attention over the eight-show series, alternative presentation of the content in these sequences should be considered. Also, certain "Math Fact" segments were found to have low appeal for students, and alternatives for these should be considered.
6. Evaluators found that show segments which feature Black or Latino families are well received by both Black and Latino students. Therefore, this type of approach to multicultural education should be continued in future productions.
7. Since measures of appeal and comprehension of story line were quite high for the target audience and math content measures somewhat lower, it is suggested that one possible route to improving students' math learning might be a better integration of dramatic story line and math content.
8. Special attention should be paid to the diction of cast members. It is recommended that the series use only actors who can be clearly understood by all segments of the target audience.
9. The evaluation findings indicate that younger and older students respond differently to the programs, especially in the areas of math content, attitudes, and comprehension of story line. Therefore, special attention should be given to the development of material appropriate for specific age groups, and each program should contain material appropriate for different age levels of the target audience.
10. The purpose of some shorter segments of the shows was not clear to the evaluators. It is recommended that the educational objectives, both math and cultural/social, of these shorter segments be planned and integrated into the context of the overall program as carefully as the major segments.

11. Ongoing content analysis of programs should be implemented during production in order to monitor the degree to which each program segment meets its objectives. This information would also be useful to evaluators in developing items for criterion-referenced measures of program impact.
12. More careful attention should be given to relating programs and program segments to specific cultural and social objectives of the series.
13. Although the eight-show series was evaluated in the schools, the programs were designed primarily for home-viewing. Ongoing formative evaluation efforts should attempt to examine program impact in a non-school setting.
14. A further examination of the effects of attention and appeal on comprehension, math attitudes, and knowledge of math content is recommended.
15. Due to the cumbersome and time-consuming nature of a large-scale evaluation effort, more informal evaluation efforts are recommended with smaller groups of children. It is further recommended that this process be built into the program development process from the planning stages on, in order to provide ongoing and more immediate feedback throughout all phases of program development.
16. Greater time should be allowed for the development of evaluation measures so that more extensive piloting procedures could be initiated. The smaller-scale, ongoing evaluation recommended above would facilitate this process. Special attention should be given to the development of measures of appeal and attitudes, which are especially difficult to measure.